



**INDIAN AGRICULTURAL
RESEARCH INSTITUTE, NEW DELHI**

I.A.R.I. 6

GIPNLK-4/JDIARI/60—16-3-61—5,000

PUBLICATIONS
OF
FIELD MUSEUM OF NATURAL
HISTORY

BOTANICAL SERIES
VOLUME IV



CHICAGO, U. S. A.

1918-1929

PRINTED IN THE UNITED STATES OF AMERICA
BY FIELD MUSEUM PRESS

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FIELD MUSEUM OF NATURAL HISTORY.

PUBLICATION 199.

BOTANICAL SERIES.

VOL. IV, No. 1.

NEW SPECIES OF XANTHIUM
AND SOLIDAGO.

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CHICAGO, U. S. A.

April, 1918.

NEW SPECIES OF XANTHIUM AND SOLIDAGO

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XANTHIUM (Tourn.) L.

In determining certain specimens of *Xanthium* in the Herbarium of the Field Museum, the writers have found the taxonomic status of this genus, as concerns its various species, to be very unsatisfactory at the present time. Much of the uncertainty in connection with several species arises from the difficulty encountered in the past in identifying the older specific names, names that in a number of cases, at least, were founded upon heterogeneous material (cf. E. L. Greene, Pittonia 4: 58. 1899; also T. H. Kearney, Bull. Torr. Bot. Club 24: 575. 1897). Another source of confusion in herbaria has been the erroneous identification of new and undescribed species with any one of the older, more commonly known species. Still further, we must note the well-known contempt with which common weeds such as *Xanthium* are so often regarded, a reason that explains the surprisingly small number of herbarium specimens of any one species collected heretofore in a given region.

In 1842, Wallroth (K. F. W., Beiträge zur Botanik 1ⁿ: 229; G. G. Walpers, Repert. Bot. Syst. 6: 150. 1846), monographing *Xanthium*, described five new species for this region of America. One of these, *X. xanthocarpum*, described as having tripartite spines and coming from fields between Staunton and Charlottesville, Virginia, is easily recognized as being Wallroth's North American segregate from *X. spinosum* L. Under *X. spinosum* L., Wallroth¹ included the plants of southern Europe, and indeed Linnaeus himself had understood this species as European ("Habitat in Lusitania, Monspelii." Sp. Pl. Edit. II: 1400. 1763). But, more recently, this viewpoint has changed. Thus, the *Index Kewensis* terms *X. spinosum* L. "cosmopolitan." And some other authorities (e. g., A. Gray, Synopt. Fl. N. Amer. 1ⁿ: 253. 1884) even treat it as a tropical American species. Wallroth's North American segregate seems to have been ignored uniformly by our manuals, apparently with justice.

¹ We rely upon Walpers' *Repertorium* (loc. cit.) for Wallroth's diagnoses, etc.

Wallroth's other four species have been accorded various interpretations by different authors, only one species, *X. pennsylvanicum*, having definitely survived the several reductions to synonymy.¹ This species appears to be correctly described by Britton and Brown (Illustr. Fl., Edit. II, 3: 346, fig. 4137. 1913) and still more recently by Shull (Bot. Gaz. 59: 476, fig. 2. 1915). Robinson and Fernald (Gray's Man., Edit. VII, 829. 1908) refer *X. pennsylvanicum* Wallr. doubtfully to *X. canadense* Miller, a species advanced in the eighth edition of Miller's Dictionary but equated in the ninth (posthumous) edition with *X. orientale* L., and likewise equated recently by O. Hoffmann (Engl. and Prantl Natürl. Pflanzenfamilien 4^v: 223. 1894), Britton and Brown (loc. cit.), and others. Shull (loc. cit.) maintains the names *X. pennsylvanicum* and *X. canadense* separately for United States material and illustrates each. But by *X. canadense* he means the species figured by Britton and Brown (loc. cit. fig. 4139) as *X. americanum* Walt., a plant formerly confused with the European *X. strumarium* L.² To us, however, it seems safer to retain the name *X. americanum* Walt. and to reject the name *X. canadense* Miller, at least until a thorough and painstaking revision of the entire genus shall have been made.

In the Herbarium of Field Museum are a number of specimens which are clearly conspecific and which we regard as *X. americanum* Walt. As will be seen below, these represent a range extending from Illinois to New York, south to Florida and west to Texas:

Dr. Geo. Vasey, Chicago, Ill. (Herb. Field Mus. catalogue no. 467371); *Earl E. Sherff* 1826, prairie, Chicago, Ill., Aug. 30, 1912 (Herb. Field Mus. cat. no. 435932); *F. C. Gates* 10024, Hancock County, Ill., Sept. 10, 1916 (Herb. Field Mus. cat. no. 472764); *Harry N. Patterson*, vicinity of Oquawka, Ill. (Herb. Field Mus. cat. nos. 209229 and 209230); *Elihu Hall*, fields, etc., Menard Co., Ill. (Herb. Field Mus. cat. no. 206218); *idem*, Ill. (Herb. Field Mus. cat. no. 453866); *A. B. Burgess* 365, pasture, Prairie Ronde, Mich., Sept. 27, 1903 (Herb. Field Mus. cat. no. 144710); *Dr. Chas. F. Millspaugh*, banks of the Susquehanna River, Vestal, N. Y., Sept. 10, 1886 (Herb. Field Mus. cat. no. 18744); *Dr. J. T. Rothrock*, streets, Philadelphia, Pa., Sept. 22, 1877 (Herb. Field Mus. cat. no. 320565); *A. A. Heller*, on Little Conestoga near Stoneroad's Mill, Lancaster Co., Pa., Oct. 5, 1901 (Herb. Field

¹ It must be remarked, however, that Wallroth's treatment of the genus, regardless of its merit or demerit, appears to have received all too scanty a study. Gray (loc. cit.) omits all mention of Wallroth's names and so appears to have overlooked them entirely.

² In passing, we note Shull to say "it is now known that *X. strumarium* has never been introduced into America." But in 1912, Fernald (Rhodora 14: 239.) reported finding a single large plant of "true *X. strumarium*" growing at Revere, Massachusetts.

Mus. cat. no. 430064); Dr. Arthur Schott, near Georgetown, D. C., Sept. 6, 1863 (Herb. Field Mus. cat. no. 44074); J. M. Greenman 538, along the river near Tygart Junction, Barbour Co., W. Va., Sept. 24, 1904 (Herb. Field Mus. cat. no. 345709); A. S. Hitchcock, Key West, Fla., Mar. 28-30, 1906 (Herb. Field Mus. cat. no. 230307); *anonymus*, Lake City, Fla. (Herb. Fla. Agri. Coll. no. 1279, Herb. Field Mus. cat. no. 234909); Royal A. Dixon 40, Huntsville, Texas, June 3-12, 1908 (Herb. Field Mus. cat. no. 237976).

A study of the specimens in the above list shows *X. americanum* to have for its fruiting involucrè a bur distinctly ovoid in shape, 1.2-1.5 cm. long (exclusive of the beaks), the beaks straight or nearly so, and the entire body tending to be, aside from its prickles, more or less glabrous; the prickles are straight from the base almost to the apex, where they are usually hooked. On comparison with these specimens, we find three sheets of material that show striking departures in certain directions, and a fourth bearing material that is more properly comparable with *X. pennsylvanicum* Wallr., from which it differs, however, in several important respects. As all four of these specimens are completely irreconcilable with any form of *Xanthium* known to us, they are described herewith as representing new species:

***Xanthium leptocarpum* Millspaugh & Sherff sp. nov. Pl. I, & V ff. 1 & 5.**

Herba annua, 3-5 dm. alta; caule inermi, superne scabro. Folia alterna, circumambitu plus minusve deltoidea et trilobata, margine dentata, basi triplinervia et cordata aut subtruncata, utrimque setulis adpressis vestita, infra sed non supra minute reticulata, petiolata, petiolis adjectis 7-19 cm. longa, petiolis tenuibus et laminis subaequantibus. Fructus multi, 4-12 simul congregati, anguste cylindrico-fusiformi, badii, superne sensim angustati et in duo rostra arcuata distantia producti, exteriore facie 18-40 aculeis (2-3 aut rare-4 mm. longis) armati, pubescentes et numerosis punctis resinæ punctati uti bases aculeorum et rostrorum; rostris et aculeis ad apicem hamosis, rostris crassioribus et paulo longioribus; fructus corpore (rostris non adjectis) 1.3-1.6 cm. longo, 3.5-5 mm. crasso. Achaenia 2; maiore circum 1.8 cm. longo et 4 mm. lato, 3-costato, levi, base acuminato, rostro abrupte mucronulato.

L. R. Jones, Burlington, Vermont, September 12, 1896 (type in Herb. Field Museum, cat. no. 430860).

This species is very distinct in the appearance of its fruiting involucrè. These have a reddish-brown or chestnut color and are narrowly cylindric-fusiform, not ovoid. The prickles are very few in number (18-40) and noticeably far apart.

Xanthium oligacanthum Piper, a far-western species described from Washington, appears from its description to be nearest this species. But *X. oligacanthum* is described as having the fruiting involucres 5–7 mm. thick, not only 3.5–5 mm. thick as in our species.

***Xanthium arcuatum* Millspaugh & Sherff sp. nov. Pl. II, & V ff. 2 & 6.**

Herba annua, caule inermi, habitu X. leptocarpo non dissimilis; foliis infra minute et subobscure reticulatis et resina punctatis. Fructus pauciores et crassiores, 2–4 simul congregati, anguste ovati, apice rostris et facie exteriore numerosis (100–170) aculeis armati; rostris rectis aut minime arcuatis, apice hamosis, 3.5–5 mm. longis, non pubescentibus sed infra puncta resinae ferentibus; aculeis tenuibus (subrectis aut) maximam partem arcuatis, plus minusve rubro-purpureo tinctis, 4–6 mm. longis, apice hamosis, infra resiniferis ut corpus; corpore (rostris non adjectis) demum 1.3–1.5 cm. longo et 5–6 mm. crasso. Achenia 2; maiore circum 1.8 cm. longo et 5 mm. lato, 3-costato, levi, base obtuse orbiculato, rostro abrupte aristato.

T. F. Lucy, river shores and low places, Chemung County, New York, October 11, 1896 (**type** in Herb. Field Museum, cat. no. 4953).

Not only are the burs more or less of a decidedly reddish-purple shade, but the prickles are very numerous and are mainly flexed or arcuate from the base to the apical hook, not straight as in *X. americanum*. The burs suggest those of *X. inflexum* Mack. & Bush, but are smaller, of more delicate structure and do not have strongly incurved beaks.

***Xanthium cylindricum* Millspaugh & Sherff sp. nov. Pl. III, & V ff. 3 & 7.**

Herba, veri similiter annua; caule inermi. Folia magna, alterna, quibusdam foliis *Hibisci militaris* Cav. simillima, circumambitu sub-deltideo-ovata, trilobata (et fere hastata) aut quinquelobata, margine dentata, basi triplinervia et cordata aut subtruncata, membranacea, scabra aut tactui etiam fere levia, minute sed perspicue reticulata, setulis adpressis vestita, infra paucis punctis resinae punctata, petiolis adjectis 1.3–2.5 dm. longa, petiolis tenuibus et laminis subaequantibus. Fructus multi, 3–8 simul congregati, cylindrico-fusiformi, rubro-badii, rostris et aculeis armati, punctis minutis resinae punctati, aliter glabri; duabus rostris arcuatis, ad apicem hamosis, 4–5 mm. longis; aculeis (100–150) tentibus, rubro-badiis, ad apicem hamosis, 2.5–3.5 mm. longis; corpore (rostris non adjectis) 1.4–1.6 cm. longo, 4–5 mm. crasso. Achenia 2; maiore circum 1.5 cm. longo et 3 mm. lato, 3-costato, levi, base acute orbiculato, apice sensim in rostrum mucronulatum producto.

J. K. Small and A. M. Hager, Chimney Rock to Hendersonville, North Carolina, October 3, 1901 (**type** in Herb. Field Museum, cat. no. 401312).

The unique character of the foliage stamps this species as most interesting. The leaves are remarkably like many of those met with on *Hibiscus militaris* Cav., and undoubtedly give the species an appearance in the field unlike that of any other North American species. The burs have a body distinctly cylindrical, not ovoid, and the beaks are curved.

Xanthium crassifolium Millspaugh & Sherff sp. nov. Pl. IV, & Vff. 4 & 8.

Herba, veri similiter annua; caule inermi, superne setulis albis (caulem inferiorem non vidimus) scabro. Folia alterna, crassa et non membranacea, circumambitu subdettoidea et tri-aut quinquelobata (et foliis quarumdam Malvacearum, exempli gratia *Sphaeralcea remota* (Greene) Fernald et *Althaea officinalis* L., simillima), basi triplinervia, multis setulis albis adpressis scabra, numerosis punctis parvis resinae punctata, petiolata, petiolis adjectis 5–17 cm. longa, petiolis laminis subaequantibus; nullis areolis reticulatis manifestis supra aut infra. Fructus singulatim aut 2–3 simul dispositi, anguste aut sublate cylindrico-fusiformi, badii, superne sensim duo rostra arcuata et hamosa producti; exteriore facie 120–180 hamosis aculeis (3.5–5 mm. longis et rostris subaequantibus) armati, pilosi et resina punctati ut aculei ad basim et rostra infra; fructus corpore (rostris non adjectis) demum 1.7–1.8 cm. longo et 6–7.5 mm. crasso; rostris 4–6 mm. longis. Achenia 2; maiore circum 2 cm. longo et 6 mm. lato, 5-costato, transverse rugoso, in suum basem orbiculatum et in rostri basem latum angustato abrupte.

B. Mackensen 123, San Antonio, Texas, October 8 and November 15, 1911 (type in Herb. Field Museum, cat. no. 324122); Dr. J. Gregg, 457, Sept. 20, *sine loc.*¹ (Herb. Missouri Botanical Garden, no. 85591).

In certain characters, this species seems nearest *Xanthium bubalocarbon* Bush, which is described, however, as having the burs ovoid, 2.5–4 cm. long ("including the short beaks"), and 2–3 cm. thick ("including the prickles"), the beaks 6–8 mm. long and the burs even much exceeding in size those of *X. speciosum* Kearney,—a species with burs broader than those of *X. crassifolium*.²

In addition to the above four new species, represented in the herbarium of this museum, we find still another among the specimens belonging to the herbarium of the Missouri Botanical Garden:

¹ His numeration appears, however, to place this in Mexico.

² On going to press we have received a delayed consignment of plants from the Missouri Botanical Garden. Among these is the type material of *X. bubalocarbon* which we find strikingly distinct: its mammoth burs are not only much larger but more closely and bristly echinate than those of *X. crassifolium* and the leaves are larger and thinner.

Xanthium acutilobum Millspaugh & Sherff, sp. nov.

Herba, veri similiter annua; caule inermi, superne setulis albis scabro, setulorum basibus tuberculato-crassatis. Folia alterna, sub-membranacea, circumambitu subhastato-triangulata, acute 3-7-lobata et dentata, basi triplinervia et cordata aut truncata, utrimque setulis albis adpressis vestita et non minutissime reticulata, petiolata, petiolis adjectis 0.6-2.2 dm. longa, petiolis tenuibus et laminis subaequantibus. Fructus non numerosi, maximam partem singulatim dispositi, ovato-cylindrici, superne sensim in duo rostra producti (rostris minime arcuatibus, ad apicem hamosis), demum badii; exteriore facie 120-180 hamosis aculeis (qui 3-4.5 mm. longi et infra non solum resiniferi sed etiam sparsim pilosi sunt) armati, numerosis punctis resinae punctati; fructus corpore (rostris, non adjectis) demum circum 1.6 cm. longo et 5-6 mm. crasso; rostris infra hispidis, circum 5 mm. longis. Achenia 2; maiore circum 2.1 cm. longo et 5 mm. lato; tergo levi sed altero facie 5-costato, corpore sensim in basem acutum et apicem mucronatum angustato.

J. Reverchon, Oak Cliff, Texas, September 2 (type in Herb. Missouri Botanical Garden no. 85603; duplicate sheets in the same herbarium bear the numbers 85470 and 85485).

The privilege of examining the *Xanthium* sheets of the Missouri Botanical Garden comes to us too late to allow of the preparation of an illustrative plate of this species in time for this publication. In fruiting involucres *X. acutilobum* resembles *X. crassifolium*, from which it is very distinct, however, in its different-shaped, thinner, and much larger leaves and in the characters of the achene.

SOLIDAGO L.

In the summer of 1917, a peculiar specimen of *Solidago* came to our notice. It had been collected by Isaac Holton near Morris, Illinois, September 13, 1850, and during all the years since then had remained with merely the name *Solidago* upon its label. In its inflorescence it suggested at once *S. speciosa* Nutt., especially the smaller form of that species often termed var. *angustata* T. & G. (*S. rigidiuscula* Porter). But the heads were noticeably smaller than heads of the same degree of maturity in any material of *S. speciosa*. The leaves did not possess the pronounced reticulation that is so characteristic of the leaves of *S. speciosa*; and, what was still more striking, the lower leaves were cuneate-ob lanceolate in outline and distinctly notched at the apex.

By reference to other material collected by Holton on the same day, it was learned that he had collected at least one plant that day along the Illinois-Michigan canal (*Aster sericeus* Vent.). Trips were made to Morris on September 8 and September 23, 1917, for the express

purpose of collecting once more, if possible, this interesting *Solidago*. An aggregate distance of nearly twenty-five miles was traveled on foot in that vicinity, special attention being given to the flora along the now abandoned canal and the railroad rights-of-way. Elsewhere the land either was under intensive cultivation (or pasturage), or was swampy and unsuited to a species presumably of the prairie. Even the roadsides were found in most cases to have had their native flora more or less entirely exterminated in the past by mowing.¹ A careful search failed to reveal the plant. We fear that the rapid commercial and agricultural development of the land about Morris, during the few years subsequent to the opening of the Illinois-Michigan Canal in 1848,² may have rendered this species extinct.

That a permanent record of the plant may be left, we present a rather full taxonomic description:

Solidago emarginata Millspaugh & Sherff sp. nov. Pl. VI.

Herba, perennis (?), = 5 dm. alta, simplex (forsan ad basim ramosa). Caulis infra subglaber, superne pubescens. Folia alterna, non petiolata, glabra sed margine ciliata, non perspicue reticulata; inferiora cuneato-ob lanceolata, ad basim angustata sensim, ad apicem valde et perspicue emarginata sinu 1-4 mm. alto, 2-7 cm. longa et 6-9 mm. lata; superiora, linearia aut linear-lanceolata, utrimque acuminata, 3-7 cm. longa et 4-8 mm. lata, summa cum fasciculis axillaribus foliolorum. Inflorescentia thyrsiforma, = 2 dm. longa; racemis multis, gracilibus, suberectis, 2-7 cm. longis; ramulis tenuibus et pubescentibus. Capitula (immatura) oblonga, 2-3.5 mm. alta; bracteis 3-4-seriatis, linear-oblongis, non nisi ad apicem pubescentibus, obtusis, ad tergum subcarinatis, exterioribus sensim brevioribus; radiis non observatis; disci flosculis circum 10; pappi setis in ovario scabridis.

I. F. Holton, near Morris, Illinois, September 13, 1850 (type Herb. University of Chicago, in Herb. Field Museum cat. no. 368080).

¹ Concerning the peculiar conditions that have been tending toward the extermination of our native prairie species in Illinois, see E. S. Steele, Contrib. U. S. Nat. Herb. 18: 360. 1911.

² For various data connected with Morris and vicinity, consult C. O. Sauer, Ill. State Geol. Surv. Bull. 27, 1916.



1
Xanthium leptocephalum Nutt. (var.)
Spec. of



Plate II

Vaccinium corymbosum Michx. "Serratum"

Fig. 2



Xanthium marginatum Willd. Schlecht.
Xanthium marginatum Willd. Schlecht.

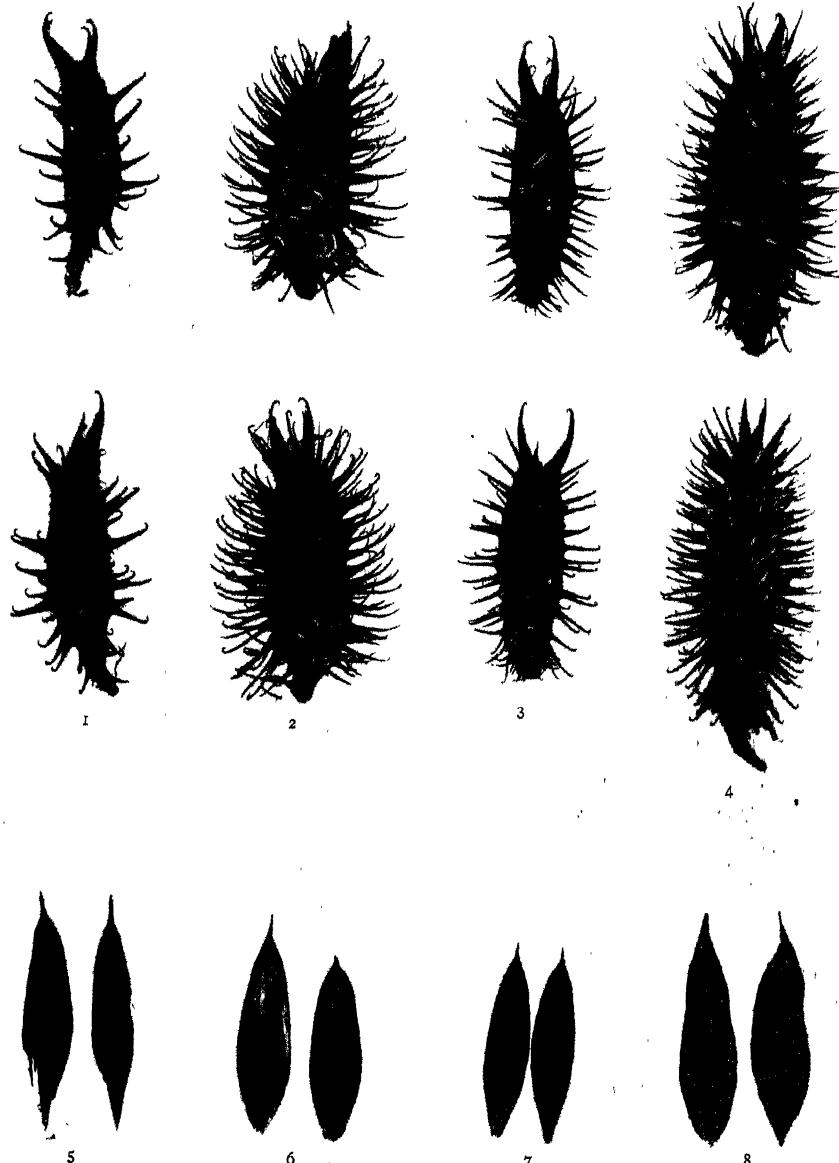


NEGATIVE
NO
1
2

Herbarium of B. Mackensen

Collector: B. MACKENSEN.

Xanthium strumarium Willd. & Schriff
Hyp. sp.

1 and 5, *X. leptocarpum*2 and 6, *X. arcuatum*3 and 7, *X. cylindricum*4 and 8, *X. crassifolium*(All enlarged $\frac{1}{2}$ diameter)



Solidago ^{Type of} *marginata* Millsp. & Schaff. *Solidago*

FIELD MUSEUM OF NATURAL HISTORY.

PUBLICATION 204.

BOTANICAL SERIES.

VOL. IV, No. 2

REVISION OF THE NORTH AMERICAN
SPECIES OF XANTHIUM

BY

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AND
EARL EDWARD SHERFF.

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CHICAGO, U. S. A.

Issued April 30, 1919.

REVISION OF THE NORTH AMERICAN SPECIES OF XANTHIUM

CHARLES F. MILLSPAUGH, M.D., and EARL E. SHERFF, Ph.D

The monographic study of the genus *Xanthium* is involved in difficulties not only as to bibliography but also as to species concept. Thanks to the kind and hearty co-operation of various botanists, we have been able to settle very satisfactorily the numerous matters of bibliography. The species concept in *Xanthium*, however, must long remain a perplexing problem. In temperate regions, the plants do not mature their fruits sufficiently for exact determination until after frost comes and the majority of collecting botanists have ceased their field-work. This renders good material in herbaria scanty in quantity and inadequate in quality. Some of the species are known to exhibit most striking variations in fruiting characters,—variations that with many botanists would be taken to represent varieties or subspecies. In fact, several of the more pronounced of these forms have been made the basis of new species by certain authors, notably Greene (e.g., *X. acutum*, *X. affine*, *X. californicum*, *X. glanduliferum*). In the present monograph the writers have endeavored to be neither hasty in the proposal of new specific names nor radical in the reduction of old names to synonymy. The taxonomic treatment has been made to accord as strictly as possible with the observed data. We have retained several of the less well known species (e.g., *X. acerosum*, *X. cylindricum*, *X. globosum*, species that with some botanists might be reduced to varietal or subspecific rank), because we have felt that only after further field observations and breeding tests can satisfactory conclusions as to their true status be reached.

Many of the numerous references in literature have necessarily been omitted in the main body of our text: for a large number of these references the reader is directed to De Candolle's *Prodromus* (6:522–524. 1836) and to Wallroth's *Monograph of Xanthium* (*Beitr. Bot.* 1st: 229–244. 1844). Since the publications of De Candolle and of Wallroth, several other more or less extended studies of the genus have been made: In 1893, Rowlee (*Bull. Torr. Bot. Club* 20:10), writing upon the seedling development of *Xanthium*, noted that "both

achenes in a single head frequently germinate, usually not at the same time however, so the seedlings will be at two stages of growth." In 1895, Arthur (Proc. Soc. Prom. Agricult. Science 16:70-79) remarked upon the inequality in size between the two achenes in the burs of *Xanthium* and the delayed germination of the smaller one. Arthur stated (*loc. cit.*, p. 77) that "the bur with its contents is the physiological equivalent of an acheneum." Later, Masterman (Ohio Nat. 1:69-70. 1901) published observations upon several thousand specimens which showed results directly opposite to those of Arthur (thus, of 3000 burs, 2751 produced two plants each, at the same time).

In 1906, Crocker (Bot. Gaz. 42:265-291), writing upon delayed germination of seeds, treated of the physiological conditions of delayed germination of *Xanthium* seeds. In 1908, Bitter, who had been inspired by the early observations of Lasch (Bot. Zeitung 14:409. 1856) to undertake careful cultural researches upon certain species of *Xanthium*, was able to describe several pronounced races of *X. italicum* and of *X. spinosum*. His numerous attempts at crossing *X. spinosum* with species of the Section *Euxanthium* had been in vain. Thus he states (Abhandl. Nat. Ver. Bremen 19ⁿ:291. 1908): "Bastarde lassen sich nach meinen Erfahrungen zwischen den Euxanthien leicht erzielen, wenigstens habe ich *X. macrocarpum* DC. und *X. italicum* erfolgreich mit *X. strumarium* gekreuzt; dagegen waren meine vielfachen Versuche, *X. spinosum* mit Euxanthien zu kreuzen, erfolglos."

Somewhat later in the same year, Thellung (Verhandl. Bot. Verein Brandenb. 50ⁿ: 137-151; see also Mitteil. Bot. Mus. Univ. Zurich 58: 505-512. 1912) published a very comprehensive survey of the botanical literature relating to *X. orientale* L. and *X. echinatum* Murr. Thellung's concept of these two species was so broad that his treatment of them was stretched almost into monographic proportions. His work in the herbarium seems to have been far less extensive than his work in the library. We are not able otherwise to explain many of his numerous equations of species with each other,—species which in several instances are so strikingly unlike in fruit characters that we are entirely unable to accept their reduction to synonymy by Thellung.

In 1911, Shull (Bot. Gaz. 52:453-477) published his investigations upon the oxygen minimum and the germination of *Xanthium* seeds. Later, in 1914, the same writer (Bot. Gaz. 57 : 64-69) presented further data obtained along these lines. Likewise in 1914, Dalbey (Kansas Univ. Science Bull. 9 : 57-65 and pls. 16-22) enumerated various anatomical characters of *X. pennsylvanicum*, *X. americanum* [= *X. chinense*] and *X. globosum*. She states that these three species "present some striking external characteristics, while in their anatomy there

are some definite but minor differences which might prove of uncertain value in classification." The following year Farr described and illustrated the origin of the inflorescences of *Xanthium* (Bot. Gaz. 59: 136-148 and pl. 10. 1915). Several interesting conclusions are stated by Farr. Among these, we note (*loc. cit.*, p. 145) that the "terminal heads became staminate, because the vascular supply was inadequate to compensate for the excessive transpiration, and hence the pistils have aborted"; also that "the bur is a modified capitulum, differing from the typical head of Compositae chiefly in the two depressions in the receptacle. These pits originate through a temporary arrest of development, which may possibly be attributed to contact with the tips of the recurved involucral bracts. This recurring of the bracts may be the result of limited space due to the subtending structures."

Throughout the prosecution of our own study, we have received the most generous assistance from other botanists, both in America and, in Europe. It is with a sense of genuine pleasure that we express our gratitude for such help, which usually consisted either in loaning herbarium material, in furnishing photographic reproductions of descriptions and plates, or in extending to us various herbarium facilities. Chief among those to whom we are thus indebted are Prof. Augusto Béguinot, Director, R. Orto Botanico, Padua; Dr. Ezra Brainerd of Middlebury, Vermont; Dr. N. L. Britton, Director of the New York Botanical Garden; Miss Mary A. Day, Librarian of Gray Herbarium; the late M. Casimir De Candolle, of Geneva; Mrs. Nellie F. Flynn of Burlington, Vermont; Dr. J. M. Greenman, Curator of the Herbarium of the Missouri Botanical Garden; Dr. H. M. Hall, of the University of California; Professor James M. Macoun, of the Canadian Geological Survey; Mr. Wm. R. Maxon, Associate Curator of the United States National Herbarium; Dr. George T. Moore, Director of the Missouri Botanical Garden; Dr. Julius A. Nieuwland, of the University of Notre Dame (in charge of the Greene Herbarium); Sir David Prain, Director of the Royal Botanical Gardens at Kew; Dr. A. B. Rendle, of the British Museum of Natural History; Dr. B. L. Robinson, Curator of Gray Herbarium; Dr. C. A. Shull of the University of Kentucky, and Miss Ethelyn M. Tucker, Librarian of the Arnold Arboretum.

Upwards of two hundred photographs were made of the more important specimens examined in other herbaria during the progress of the work. These, together with full data, are deposited in the herbarium of this Museum.

ABBREVIATIONS USED FOR HERBARIA

Hb. Calif.	Herb. University of California
Hb. Can.	Herb. Canadian Geological Survey
Hb. Chi.	Herb. University of Chicago
Hb. Field	Herb. Field Museum of Natural History
Hb. Mo.	Herb. Missouri Botanical Garden
Hb. N. Y.	Herb. New York Botanical Garden
Hb. U. S.	United States National Herbarium

Xanthium (Tourn.) Linn. Sp. Pl. 987. 1753

[Tourn. Instit. tab. 252, 1700. Linn. Gen. Pl. 424, 1754]

Herbae annuae, ramosae, crassae, plerumque scabridae aut spinosae, monoicae, sporadicae. Folia alterna, petiolis tenuibus petiolata, plus minusve lobata aut rarissime inciso-divisa, plerumque punctis resinosis parvis numerosis punctata. Capitula discoidea, homogama. Involucra mascula summa, subglobosa, multiflora, bracteis liberis 1-3-seriatis; receptaculo cylindraceo, paleaceo; corollis tubulosis, clavatis, apice 5-dentatis; staminum filamentis monadelphis, antheris liberis, conniventibus, basi ecaudatis, appendicibus apicalibus incurvato-mucronatis; stylo simplici, tenui, ad apicem plus minusve dilatato; achaenio rudimentario. Involucra feminea gamophylla, clausa aut rare subclausa, cylindrica aut ovoidea aut etiam subglobosa, hamato-aculeata aut rarissime simpliciter aculeata, ad apicem 2-rostrato (in Sect. II, Acanthoxanthio, uno aut duobus rostris saepius absentibus); intus 2-loculare; corollis absentibus; styli ramis exsertis; achenis linearibus aut etiam ovatis, compressis, plus minusve crassis, ad apicem tenuiter rostratis, levibus, singulis in loculis singulis inaequalibus involuci maturatis et manentibus.

CLAVIS GENERIS

Folia attenuata utrinque; axillis spinis tripartitis munitis; aculeis ad apicem cygneo-hamatis 1. X. spinosum

Folia cordata, ovata aut subtriangulata; axillis inermibus; aculeis ad apicem rectis aut simpliciter hamosis:

Fructus maturi plerumque maximi, aculeis et rostris adjectis 2.8-4 cm. longi et 2-3 cm. lati:

Aculei plerumque arcuati et corniformes, subcrassi:

Aculei saepius numerosi et conferti, teretes 21. X. campestre

Aculei plerumque pauciores et remoti aut subremoti, infimi ad faciem ventraliem canaliculati 19. X. oviforme

Aculei non perspicue arcuati nisi ad apicem hamosum, tenuis

20. X. speciosum

Fructus maturi minores:

Aculei pauci et remoti (20-50):

Fructus magni, corpore 1.5-1.7 cm. longo et 6-7 mm. lato; aculeis 8-10 mm. longis 10. X. cenchroides

Fructus minores:

Fructi maturi subvirides 2. *X. strumarium*

Fructi maturi plerumque flavidi aut rubri:

Fructus corpus anguste cylindricum:

Aculei recti ad apicem hamosi 8. *X. leptocarpum*Aculei dimidio supero flexi 7. *X. curvescens*

Fructus corpus ovatum aut oblongum:

Aculei cartilaginei, crassi, fructus cor-

pore circ. 8 mm. crasso 13. *X. calvum*Aculei subtenues, fructus corpore pler-
umque 5–6 mm. crasso 9. *X. Wootoni*

Aculei plures:

Fructi glabri aut subglabri:

Fructus corpus plerumque cylindricum:

Folia acute lobata; fructibus venustis; aculeis tenuibus,
2.5–3.5 mm. longis 4. *X. cylindricum*Folia subobtuse lobata; fructibus crassioribus; aculeis
crassioribus et saepius 3.5–7 mm. longis 12. *X. pennsylvanicum*Fructus corpus plerumque crasso-ovoideum aut subglo-
bosum:Rostra elongata (6–9 mm. longa); species mexicana et
austro-americana 15. *X. australe*Rostra non elongata (3–4 mm. longa);
species borali 5. *X. globosum*

Fructus corpus ovato-oblongum:

Aculei breves (saepius circ. 2 mm. longi),
basi dilatati 14. *X. palustre*

Aculei longiores, basi non perspicue dilatati:

Rostra brevia (circ. 2 mm. longa), crassa
2. *X. strumarium*

Rostra longiora (3–6 mm. longa), tenuiora:

Aculei conferti, arcuati:

Quidam aculei ad fructus rostra longissimi (8–10
mm.); rostris 5–7 mm. longis 11. *X. inflexum*Aculei aequales aut subaequales (4–6 mm. longis);
rostris 3.5–5 mm. longis 6. *X. arcuatum*Aculei remotiores, recti 3. *X. chinense*

Fructus plus minusve setosi, hispidae aut pilosi:

Aculei fructuum maturorum dense, longe et molliter fusco-
pilos 18. *X. acerosum*Aculei fructuum maturorum setosi aut hispidae sed non vere
longo- et molli-pilos:Fructus 8–12 mm. longi; aculeis circum 2 mm. longis (specie
maximam partem gerontogaea) 2. *X. strumarium*

Fructus et aculei longiores:

Aculei valde hispidae:

Corporis latitudo quam longitudo
circ. dimidio minor 16. *X. echinatum*Corporis latitudo etiam minor 17. *X. italicum*

Aculei non valde hispidae.

Quidam aculei ad fructus rostra longissimi (8-10 mm.)
11. X. inflexum

Aculei aequales aut subaequales:

Corpus globoso-ovatum, rostris elongatis
15. X. australe

Corpus plerumque angustius, rostris non perspicue
elongatis 12. X. pennsylvanicum

Sect. I. *ACANTHOXANTHIUM* DC. Prodr. 5: 523. 1836; *Acanthophia* Wallr., Beitr. Bot. 1ⁿ: 241. 1844; *Acanthoxanthium* Fourr., *pro genere*, Ann. Soc. Linn. Lyon., N. Ser. 17: 110. 1869. Involucri fructigeri rostrum saepius unicum aut nullum; fructibus apice conniventibus, clausis; spinis validis ad basim foliorum; foliis numquam cordatis sed basi cuneatis.

I. *XANTHIUM SPINOSUM* Linn. Sp. Pl. 987. 1753.

Xanthium xanthocarpon Wallr. Beitr. Bot. 1ⁿ: 241. 1844.

Acanthoxanthium spinosum Fourr. Ann. Soc. Linn. Lyon., N. Ser. 17: 110. 1869.

Caulis pubescens, ramosus, erectus aut ascendens, 3-12 dm. altus. Folia lanceolata aut ovato-lanceolata, petiolata, utrinque acuminata aut acuta, 2-4-lobata aut supera integra, infra et ad venas supra canescens, petiolis adjectis 4-12 cm. longa, axillis spinis gilvis tri-partitis usque ad 2.5 cm. longis munita; petiolis 0.5-2 cm. longis. Fructus (Pl. VII, f. 1; Pl. VIII, ff. 1-3) oblongo-cylindrici, plerumque flavido-virides, pubescentes; rostris tenuibus, levibus, acribus, circ. 3 mm. longis, plerumque uno et saepe etiam duobus absentibus; aculeis distinctis aut remotis, ex apice cygneo-curvato in hamum inflexum quartam aculei partem desinentibus.¹

DISTRIBUTION: Now generally distributed almost throughout the United States; found also in South America, where probably native,² central Europe, "western Asia, southern Africa and in Australia."

SPECIMENS EXAMINED.³ NEW YORK: without locality or date, *M. Ruger* (Hb. Mo. 720720). NEW JERSEY: Camden, Aug., 1878, *Isaac C. Martindale* (Hb. Mo. 720837). DISTRICT OF COLUMBIA: vicin. of Washington, waste ground, *E. S. Steele* 43 (Hb. Mo. 85567 and 85568). VIRGINIA: Bedford County, *A. H. Curtis* 3472 (Hb. Mo. 85569); Wythe County, Reed Creek, at base of lower rocks, July 23, 1892, *John K. Small* (Hb. Mo. 85570). FLORIDA: Apalachicola, without date, *Dr. A. W. Chapman* (Hb. Mo. 783796). ILLINOIS: Mound City,

¹ It may be remarked that in the description we have omitted all reference to achene characters. As the characters of the achene can not be described satisfactorily from fruits not known to be mature, and as thoroughly mature fruits have not, in all species, been available for dissection, it has been deemed best to omit these characters from all of the specific descriptions.

² Cf. Thellung, Mitteil. bot. Mus. Univ. Zurich 58 : 505. 1912.

³ Many omitted here for lack of space.

without date, George Vasey (Hb. Field 13470). KENTUCKY: Bowling Green, Oct., 1899, Sadie F. Price (Hb. Mo. 85573). TENNESSEE: Knoxville, vacant lots, July, 1893, A. Ruth (Hb. Mo. 720836). MISSOURI: St. Louis, Oct. 23, 1893, H. Eggert (Hb. Mo. 85575, 720560 and 720835). TEXAS: Handley, Sept. 23, 1902, J. Reverchon (Hb. Mo. 85580). NEW MEXICO: near Pecos, Paul C. Standley 5150 (Hb. Mo. 85582; Hb. N. Y.). NEVADA: Verdi, Oct., 1893, C. F. Sonne (Hb. Calif. 196334). ARIZONA: Prescott, David Griffiths 7344 (Hb. Mo. 85583). VANCOUVER ISLAND: Nanaimo, July 7, 1887, John Macoun (Hb. N. Y.). WASHINGTON: Walla Walla, July, 1898, Savage, Cameron and Lenocker (Hb. Mo. 85584). CALIFORNIA: Los Angeles, Le Roy Abrams 4181 (Hb. Calif. 149138; Hb. Mo. 85589; Hb. N. Y.); Sherman, Ernest Braunton 731 (Hb. Calif. 54178); vicin. Mendocino, H. E. Brown 919 (Hb. N. Y.); near Yreka, Geo. D. Butler 991 (Hb. Calif. 163874); Colusa County, J. Burtt Davy 4277 (Hb. Calif. 36807); near Durham, roadsides and fields, A. A. Heller 12655 (Hb. Mo. 802945); San Simeon Bay, July 22, 1876, Dr. Edw. Palmer (Hb. Mo. 85587); Haywards, Nov. 14, 1893, Ivar Tidstrom (Hb. Calif. 36806); Avalon, Santa Catalina Isl., Aug., 1902, Blanch Trask (Hb. N. Y.).

Wallroth (*loc. cit.*) founded his *Xanthium xanthocarpon* upon a specimen by Beyrich, from fields between Staunton and Charlottesville, Virginia. The distinctive characters tabulated in his description are entirely too inconstant, however, to serve in distinguishing the species from true *X. spinosum* L. Thus, for example, Wallroth described the beaks as unequal, the larger one twice stouter than the prickles: ("Rostris inaequalibus, majore aculeis duplo validiore"). In the nearly two hundred specimens of *X. spinosum* which we have examined, from North America, we have seen several that matched Wallroth's description in these and other respects precisely. Nevertheless these specimens were but slight variations from the more common, short-beaked form regarded by Wallroth as representing the true *Xanthium spinosum* L.

Sect. II. *EUXANTHIUM* DC. Prodr. 5 : 523. 1836; *Anoplia* Wallr. Beitr. Bot. 1ⁿ: 229. 1844. Involuci fructigeri rostra apice nunc recta (Tribus I. *Orthorrhyncha* Wallr. *loc. cit.*), nunc in hamum varie inflexum desinentia (Tribus II. *Campylorrhyncha* Wallr., *loc. cit.*), nunc hiatu longitudinali magis minusve contracto reclusa vel teretia, nunc transversim fissa, veluti bivalvia; caulis erectis saepius purpureo-maculatis; foliis dentatis; spinis ad basim foliorum nullis.

2. *XANTHIUM STRUMARIUM* Linn. Sp. Pl. 987. 1753.
Xanthium priscorum Wallr. Beitr. Bot., 1^o: 227. 1844. (*nom. semi-nudum.*)
Xanthium antiquorum Wallr. loc. cit. 229
Xanthium strumarium L. var. *antiquorum* (Wallr.) Ball, Jour. Linn. Soc. 16 : 503. 1878.
Xanthium abyssinicum Wallr. loc. cit. 230.
Xanthium discolor Wallr. loc. cit. 232.
Xanthium Roxburghii Wallr. loc. cit. 233.
Xanthium brevirostre Wallr. loc. cit. 235.

Caulis subramosus, pubescens, 0.4–1.5 m. altus. Folia triangulato-deltoidea et ad basim truncata aut subcordata, 3–5-lobata, utrinque pilis adpressis strigosis vestita et concoloria, petiolis adjectis 0.6–2.5 dm. longa; petiolis laminas subaequantibus aut excedentibus. Fructuum (Pl. VII, f. 2; Pl. VIII, ff. 4–8) corpus ovoideum, aut tumidum et subglobosum, plerumque subviride, pubescens, 0.8–1.4 cm. longum; rostris versus apicem rectis aut incurvatis, 1–2 mm. longis, saepius distantibus; aculeis rectis, ad apicem hamosis, supra glabris, infra plus minus pubescentibus, circ. 2 (rarius 3) mm. longis.

DISTRIBUTION: Adventive in Massachusetts and California; native of the north-temperate and tropical regions of the Eastern Hemisphere.

SPECIMENS EXAMINED: MASSACHUSETTS: Revere, Crescent Beach, Oct. 20, 1912, *M. L. Fernald* (Hb. Gray). CALIFORNIA: Colorado Desert, Cameron Lake, Mar. 28, 1901, *T. S. Brandegee* (Hb. Calif. 131246).

We have already (Field Mus. Bot. 4 : 2. 1918) noted the collection of genuine *X. strumarium* in North America, by *Fernald*, in 1912. It is of interest to note that, several years earlier, this species was collected in the extreme southern part of California, by *Brandegee*. We have not seen the species from elsewhere in America.¹

In 1830 Rafinesque listed (Med. Fl. 2 : 275) "2 native species *Xanthium crassum* and *undulatum* Raf. mistaken for *X. strumarium* and *orientale* by authors." Thus Rafinesque is seen to have realized, at an early date, that the common forms of *Xanthium* in America were not referable to *X. strumarium* and *X. orientale* (see p. 26, foot-note). Rafinesque's two names appear to have been ignored, or indeed overlooked, by botanists since then. But obviously these names can be treated only as *nomina nuda*, for their precise application to definite American species is impossible. Characteristically, in this connection, Rafinesque fails to mention his own *Xanthium maculatum*, described, in detail, from the eastern United States eleven years before. There exists, in Gray Herbarium, a good co-type of *X. abyssinicum* Wallr. (*W. Schimper* 1343). This specimen we are entirely unable to separate

¹ At least as an escaped plant. We have seen good fruiting material however, raised by Dr. John M. Adams at Cincinnati, Ohio, in 1918, from seed imported with soy-beans from Manchuria (specimen in Hb. Ohio Agr. Exp. Station).

from *X. strumarium* L.; in the same herbarium is a specimen (Kotschy i iter Nubicum 319, ad ripas Nili albi prope Chartum in provincia Sennar, Mar. 4, 1840) which has slightly longer and more numerous prickles, these more hirsute below than in most other specimens. This is the form cited by Wallroth for his *X. antiquorum*.¹ It is matched very well by a fine specimen in the Herbarium of Field Museum (*Fred S. Meyers* 215, waste places, Jaffa, Aug. 2, 1902, Hb. Field 162920) coming from Palestine. The distinctions emphasized appear to us, however, too slight and inconstant to warrant maintaining *X. antiquorum* apart from *X. strumarium*. Likewise, after examining a number of specimens from India (mainly in Hb. Gray) we are convinced that *X. discolor* Wallr., *X. Roxburghii* Wallr. and *X. brevirostre* Wallr. are merely forms of *X. strumarium* L. (as indeed they were regarded by Hooker, Fl. Brit. Ind., 3 : 303. 1881).²

3. *XANTHIUM CHINENSE* Mill. Gard. Dict. Edit. VIII, No. 4. 1768.
Xanthium chinense Mill. Abrdg. Gard. Dict. Edit. VI, No. 4.
 1771.
Xanthium occidentale Bertol. Lucubr. Herb. 38. 1822.
Xanthium macrocarpum var. *glabratum* DC. Prodr. 5 : 523. 1836.
 ex. descr.
Xanthium pungens Wallr. Beitr. Bot. 1ⁿ: 231. 1844.
Xanthium longirostre Wallr. loc. cit. 237; Britton Fl. Bermuda 384,
 f. 417. 1918.
Xanthium glabratum Britt. Man. 912. 1901.³

¹ *Xanthium priscorum* Wallr. (*loc. cit.* 227). Wallroth used the name *X. priscorum* in his *clavis*, accompanying it with a short diagnosis; but in the main body of his work and also in the introduction (pp. 221 and 229) he had changed the name to *X. antiquorum*. His retention of the name *X. priscorum* was clearly through an oversight. We may note a similar error in regard to his *X. eriocarpum* (which is referable to *X. ambrosioides* Hook. & Arn., for which species Wallroth merely made a new, and in his opinion, more accurate name; we have seen various excellent specimens in Hb. Gray and Hb. N. Y.). Wallroth at first (*loc. cit.* 229) advanced this species in his *clavis* under the name *X. leucocarpum*, with a short diagnosis; but in the main body of his work (p. 242) he had changed the name to *X. eriocarpum*.

² *Xanthium inaequilaterum* DC., a species with smaller fruits (5–6 mm. long exclusive of the beaks), originally described from material collected near Buitenzorg, Java, is similar to *X. strumarium*, but its smaller fruits are very distinctive. Several good (topotypic) fruiting specimens exist in Hb. Gray (Zollinger, Batavia, Java, in 1849; Teysmann, ex horto bogoriensi, Buitenzorg, Java, in 1869). These are remarkably uniform and appear to indicate that the species *X. inaequilaterum* DC. is entirely separate from *X. strumarium* L.

A number of other species of *Xanthium* have been described from the Eastern Hemisphere that undoubtedly are mere forms of *X. strumarium*; however, as opportunity has been lacking to examine authentic material, their names have been omitted from our list of synonyms.

³ *Xanthium canadense* of Rowlee, not Miller, Bull. Torr. Bot. Club 20 : 10, ff. g-m. 1893.

?*Xanthium carolinense* Dill. ex MacMillan, Geol. Nat. Hist. Surv. Minn. Bot. 1 : 535. 1892. We have not seen the original work of Dillenius, cited by MacMillan, for this reference.

Xanthium strumarium of Millsp. & Chase, Field Mus. Bot. 3 : 87, f. 1904.

Xanthium strumarium of Britton & Brown, Ill. Fl. 3 : 298, f. 3599. 1898. See also footnote, p. 40.

Caulis scaber, 0.3–1 (aut etiam-2) m. altus. Folia late triangulato-orbiculata, acute 3–5-lobata, subacute dentata, ad basim cordata aut reniformia, plerumque submembranacea, utrinque concoloria et pilis setosis adpressis brevissimis vestita, petiolis adjectis 1–3 dm. longa, inferiora interdum 2.5 dm. lata, petiolis laminis subaequantibus. Fructus (Pl. VII, f. 3; Pl. VIII, ff. 9–15) ovoidei aut fusiformes, calvescentes, aequaliter et conformiter aculeati, fusco-virides aut rubescentes; corpore sparsissime brevi-pubescenti, glanduloso, 0.9–1.5 cm. longo (rarius longiore); rostris rectis aut arcuatis, infra pubescentibus, ad apicem inflexis aut infirme hamosis, 3–6 mm. longis; aculeis glabratris aut ad basim sparsim glanduloso-pubescentibus, rectis, ad apicem hamosis, rostris aequantibus.

DISTRIBUTION: Massachusetts, Ontario and Nebraska, to Florida, Texas and California (where very rare); eastern Mexico and throughout the West Indies.

SPECIMENS EXAMINED:¹ MASSACHUSETTS: Wayland, Sept. 10, 1909, *M. L. Fernald* (Hb. Gray). CONNECTICUT: Goshen County, wet ground, Sept. 18, 1905, *C. H. Bissell* (Hb. Gray); West Hartford, border of pond, Oct. 14, 1906, *idem* (Hb. Gray). NEW YORK: Long Island, Lakeville, waste place, Sept. 25, 1899, *J. R. Churchill* (Hb. Gray) Canton, banks of Grass River, *Mrs. Orra Parker Phelps* 989 (Hb. Gray); Ogdensburg, along banks of St. Lawrence River, *eadem* 1215 (Hb. Gray; an unique form with abnormally large fruits having bodies 1.9–2.4 cm. long and 7.5–9.5 mm. thick). PENNSYLVANIA: near Philadelphia, *John H. Redfield* 3475 (Hb. Mo. 85397). MARYLAND: Plummer's Island, in Potomac River, near Cabin John, *Thomas H. Kearney* 193 (Hb. U. S. 640356); shore of Chesapeake Bay, south of Havre de Grace, *George H. Shull* 392 (Hb. Gray; Hb. Mo. 85399). DISTRICT OF COLUMBIA: Washington, *Charles L. Pollard* 718 (Hb. U. S. 234642). VIRGINIA: Bedford County, Oct. 10, 1871, *A. H. Curtiss* (Hb. Gray); Altavista, waste land, *Juliet Fauntleroy* 677 (Hb. U. S. 754995). NORTH CAROLINA: Buncombe County, roadside near Black Mountain, *Standley and Bollman* 10301 (Hb. U. S. 689122). FLORIDA: Lake City, *anonymus* (Hb. Fla. Agricul. Coll. no. 1279 in Hb. Field 234909); Key West, sandy places near the beach, *J. K. Small* 3720 (Hb. N. Y.; important as matching precisely Greenman's no. 47, topotype of *X. chinense* from vicinity of Vera Cruz). ONTARIO: Russell, near Nation River, July 28, 1911, *John Macoun* (Hb. Mo. 719899). MICHIGAN: near Port Huron, roadside ditches, *C. K. Dodge* 43 (Hb. Gray); near Port Huron, roadside ditches, *idem* 45 (Hb. Gray); near Port Huron, marshes, *idem* 48 (Hb. Gray). KENTUCKY: Bowling Green, Aug., 1899, *Sadie F. Price* (Hb. Mo. 46001).

¹ For lack of space many specimens examined must be omitted here. Our citations are complete, however, as to the material examined from Mexico and the West Indies.

TENNESSEE: vicin. Smyrna, Sept. 7, 1898, *H. Eggert* (Hb. Mo. 85404 and 85405). WEST VIRGINIA: Sweetsprings, Steele and Steele 271 (Hb. Gray; Hb. Mo. 85401). ALABAMA: Auburn, in cultivated fields, *F. S. Earle* 2202 (2 sheets in Hb. N. Y.); Auburn, Sept. 18, 1897, *Earle and Baker* (Hb. N. Y.). ILLINOIS: St. Clair County, Indian Lake, Sept. 25, 1903, *H. Eggert* (Hb. Mo. 85420);¹ MISSOURI: Swan, *B. F. Bush* 589 (Hb. Mo. 85411); Courtney, in fields, *idem* 871 (Hb. Mo. 85407); Courtney, in bottoms, *idem* 873 (Hb. Mo. 85410); Courtney, in bottoms, *idem* 7809 (Hb. Mo. 809933); St. Louis, cultivated fields, especially in rich land, Aug. 1845, *Dr. George Engelmann* (Hb. Mo. 85415 and 85416); St. Louis, riverbanks, July, 1837, *Carl A. Geyer* (Hb. Mo. 85414); Neck City, low ground, *E. J. Palmer* 1304 (Hb. Mo. 85421 and 756630); Noel, Butler Creek, gravel bars, *idem* 4220 (Hb. Mo. 716541). KANSAS: Atchison County, in fields, *A. S. Hitchcock* 727 (Hb. Gray; Hb. Mo. 85424); Riley County, low ground, *J. B. Norton* 261 (Hb. Gray). NEBRASKA: Red Cloud, *Rev. J. M. Bates* 5450 (Hb. Gray). OKLAHOMA: Sapulpa, *B. F. Bush* 298 (Hb. Mo. 85426). ARKANSAS: Fulton, in fields, *B. F. Bush* 965 (Hb. Mo. 85422). LOUISIANA: Natchitoches, wet ground, *E. J. Palmer* 8727 (Hb. Mo. 794561). TEXAS: Columbia, in fields, *B. F. Bush* 1348 (Hb. Mo. 85428); Dallas, in fields, *J. Reverchon* 2591 (Hb. Mo. 85431; Hb. N. Y.). CALIFORNIA: Fort Yuma, Colorado River bottoms, *S. B. Parish* 8360 (Hb. Gray);—a puzzling specimen, in some respects strongly suggesting *X. strumarium* L., which has been collected west of here by Brandegee at Cameron Lake. See *X. strumarium* L.). MEXICO: La Laguna, near Vera Cruz, *J. M. Greenman* 47 (Hb. Field 189512; Hb. Gray). BERMUDA ISLS.: Devonshire, cultivated ground, *Brown and Britton* 374 (Hb. Field 203890; Hb. Gray); waste grounds near Tucker's Town, *idem* 1724, (Hb. U. S. 758285). BAHAMA ISLS.: Nassau, waste grounds, *Britton and Brace* 383 (Hb. Field 171815); Nassau, Nov., 1890, *A. S. Hitchcock* (Hb. Field 174738). CUBA: Playa de Cojimar, on coral limestone near the sea, Mar. 16–26, 1906, *A. S. Hitchcock* (Hb. Field 235055); Prov. Havana, Santiago, plantations,

¹ In the same herbarium (No. 759001) is another good specimen, by Eggert, from waste places, vicinity of East St. Louis, Illinois, Oct. 14, 1886; on the same sheet with it is a specimen, closely similar in habit and foliage, but in fruits approaching *X. pennsylvanicum* Wallr. with which species it seems to be a hybrid. This second specimen is identical with two others of the same date, by Eggert (Hb. Mo. 721197; Hb. Gray). A fifth specimen of the same date and locality, likewise by Eggert (Hb. Mo. 85526) is even more clearly a hybrid: its burs are fusiform, dark reddish-brown, sparsely and inconspicuously glandular-pubescent, very sparsely aculeate, with only about 25–40 uncinate, subglabrous (unless sparsely hispid at the base) prickles, the body of the mature burs about 1.6 cm. long and 5.5 mm. thick; prickles and beaks 4–6 mm. long; the achenes mostly abortive. The burs of this last specimen present in their technical characters a slight resemblance to those of *X. Wootoni* Cockl. but this resemblance is very superficial and disappears upon visual comparison of the two sorts.

H. A. Van Hermann 360 (Hb. Field 172254); without locality, in 1865, *C. Wright* (Hb. Gray). SANTO DOMINGO: Sanchez, Rose, Fitch and Russell 4351 (Hb. U. S. 760483). PORTO RICO: Vieques Isl., Resolucion to Punta Arenas, in sand, *J. A. Shafer* 2901 (Hb. U. S. 790346). ST. CROIX: Alfred E. Ricksecker 266 (Hb. Field 70621). TORTOLA: Sea-cow Bay, roadside, *Britton and Shafer* 928 (Hb. U. S. 756709). GUADELOUPE: *Père Duss* 2816 (Hb. Field 202726).

Apparently no other species of *Xanthium* has offered heretofore so baffling a problem concerning its true status as has this species. It has been referred at various times to such species as *X. strumarium* L., *X. canadense* Mill., *X. americanum* Walt. etc. From *X. strumarium* L. it differs as a rule very distinctly in having the burs larger, smoother and greenish-brown to reddish in color, not mostly yellowish-green; furthermore, the beaks in *X. chinense* are longer. *X. canadense*, as we indicate elsewhere (p. 26, foot-note)¹ was merely *X. orientale* L., a species not known authentically in America and differing from *X. chinense* in having stouter, more coarsely hooked and more hispid prickles and more arcuate beaks.

In 1768, Philip Miller (*Gard. Dict. Edit. VIII*, no. 4) advanced a new species of *Xanthium* which he termed *X. chinense*. He described the species briefly, “4. *Xanthium (chinense)* caule inermi ramosa, aculeis fructibus erectis longissimis. China. *Xanthium* with an unarmed branching stalk, and the spines of the fruit very long and upright.” He stated, in addition, that it grew “naturally in China from whence he had received the seeds.” But, on inspecting his description, we find it to portray a species which no accounts show ever to have been collected in China, or anywhere else in the Eastern Hemisphere. The nearest approach to the description, as concerns the Orient, would be *X. strumarium* L. However, not even the Egyptian form² of *X. strumarium*, the form with spines longer than usual (2.5–3 mm.), has spines so long as to explain or justify Miller’s use of the word “longissimis.” It is very likely that this seemingly insurmountable discrepancy between description and cited habitat has, in the past, entirely deterred botanists

¹ We have already stated (*Field Mus. Bot.* 4: 2. 1918) that the name *canadense*, advanced by Miller in the eighth edition of his *Gardener’s Dictionary*, was equated in the ninth (posthumous) edition with *X. orientale* L. We may note, further, that Miller originally cited as a synonym of his species the diagnosis of *X. orientale* L. and gave also “*X. majus canadense H. L. 635*” (*Cf. Thellung, Verhandl. Bot. Verein Brandenb.* 50ⁿ: 139. 1908). But Thellung (*loc. cit.* 138) states in detail and, to us very convincingly, the evidence that this “*X. majus canadense H. L. 635*” is merely the *X. orientale* of Linnaeus. In fact, Linnaeus himself (*Sp. Pl. Edit. II:* 1400. 1762) cited “*Xanthium majus canadense. Herm. lugdb. 635*” as the second synonym of his *X. orientale*.

² *X. antiquorum* Wallr., found also in Palestine. *Cf. p. 17.*

from attacking the status of *X. chinense* in a more than cursory way.¹

Fortunately for our purpose, however, there appeared in 1771, the year of Philip Miller's death (*fide* Pritzel, Thesaurus 218. 1872) and three years subsequent to the appearance of the eighth edition of The Gardener's Dictionary, an Abridgement of Miller's Gardener's Dictionary, sixth edition.² In this abridgment, Miller introduced *X. chinense* from his Gardener's Dictionary, eighth edition, retaining the same peculiar description³ but omitting the word China. As we search his supplementary text, we find a most interesting statement: "The fourth sort [X. chinense] was discovered by the late Dr. Houston in the year 1730, growing naturally at La Vera Cruz."

Now it happens that in 1906, Dr. J. M. Greenman spent some time collecting in the neighborhood of Vera Cruz (Mexico) for Field Museum and, during the course of his work, collected specimens of *Xanthium* (Greenman 47) the fruits of which we find to match Miller's description strikingly. The prickles are not strongly inbent, as in the *X. orientale* L. that Miller knew, but *erect* ("erectis"). Nor are they short, as in the *X. strumarium* L. known to Miller, but, by comparison, *very long* ("longissimis").

It appears to us to be beyond all doubt that Miller had made the acquaintance of this species in the prime of his life, during the period of his greater literary activity, but had not published it;—that late in life when seventy-seven years of age (*fide* Pritzel, Thesaurus 218. 1872), he published an accurate though short Latin description under the name *X. chinense*, thinking that to it belonged various Chinese specimens sent to him;—and that finally, just before his death, he realized his mistake in having referred Chinese specimens to the species and so, with a view to clarity, actually stated that the original specimens came from Vera Cruz.

An examination of the Greenman plants, which we may well take as representing *X. chinense*, shows them to be the same species that grows very commonly throughout the West Indies and which Bertoloni

¹ Wallroth (Beitr. Bot. II: 223. 1844) equated *X. chinense* with his *X. discolor*, which was a segregate from *X. strumarium* L. But Wallroth expressly stated for his *X. discolor* that the prickles were short ("kurz und abstehend eingebogene Stacheln"), whence it appears that he entirely ignored the character "longissimis" given by Miller.

² Regarding the extreme rarity of this work, see Thellung (Verhandl. Bot. Verein Brandenb. 50^{II}: 144. 1908). We have been fortunate in securing excellent copies of the pertinent portions from the volume in the Library of the Arnold Arboretum, handwritten for us by the Librarian, Miss Ethelyn M. Tucker.

³ Miller dropped the word *ramosa* after *caule inermi* and added the word *simplicibus* after *erectis*.

described from Santo Domingo in 1822, under the name *X. occidentale*.¹ Moreover it is the same which Wallroth, in 1844, named somewhat provisionally *X. longirostre*. Wallroth very clearly voiced his hesitancy in publishing a new name, but he had not seen authentic Santo Domingo specimens of *X. occidentale* with which to match his *X. longirostre* material from St. Thomas and Haiti, so was constrained not to equate the two names.

Specimens from the West Indies vary considerably in size of bur and in curvature and length of beaks. Sometimes the prickles are slightly short-hispid² near the base,— not “simple” as described by Miller. The Greenman plants exhibit this same small departure from the original description. Commonly the burs are rather few, large, in color greenish-brown. A character frequently observed, especially in the West Indian material, is the peculiar appearance of many of the burs, their beaks being long, not widely divergent, somewhat incurved and suggesting the bill of a bird; this character is present on several burs of the Greenman plants.

Specimens from continental North America usually have the burs more numerous, smaller and more or less reddish in color. These specimens harmonize very well with the description of *X. pungens* Wallr., but the intergradations between the continental and West Indian forms are so numerous as to render vain all our attempts at separation.³ Hence we are compelled to regard *X. pungens* as merely a form or variety of *X. chinense*.

In not a few cases, *X. chinense* appears from herbarium specimens, to have formed hybrids with *X. pennsylvanicum* (*cf.* p. 19, foot-note). At other times the fruits, varying to a coarse, more elongate, more hispid type, display a very close approach to those of the same species, but without suggestion of hybridity. On the whole, however, the two species are very easily distinguishable.⁴

¹ Raised from seed sent by Bertero from Santo Domingo. “Nux oblonga, medio ventricosa, utrinque attenuata, muricata, aculeis raris, subulatis, uncinatis, gracilibus, apice bi-triostriis, rostris convergentibus, viridis, vix puberula.” (Bertol. Lucubr. Herb. 38. 1822).

² Rydberg (Dr. Per Axel), also Wiegand (Dr. Karl M.) each of whom made a somewhat extended preliminary study of the genus *Xanthium* and then postponed or abandoned the investigation, appear to have met with the same result. Thus we note on a sheet of typical West Indian material in Gray Herbarium (Brown and Britton 374, Bermuda) the annotation in pencil by Rydberg, “*X. americanum* P. A. R.” and, by Wiegand, “*X. pungens* Wallr. K. M. W.” By *X. americanum*, Rydberg meant, as his other herbarium annotations show, the *X. pungens* of Wallroth, which had of late been referred (by Britton and Brown, Illustr. Fl. Edit. II. 3: 346, f. 4139) to the enigmatic *X. americanum* Walt.

³ Theilung (Verhandl. Bot. Verein Brandenb. 50th: 144. 1908) equates *X. pennsylvanicum* Wallr., *X. occidentale* Bertol. and various other names categorically with *X. echinatum* Murr. The *chinense* of Miller he resolves into two parts, regarding the first or supposedly Chinese form as a variety of *X. strumarium* L. and referring

4. *XANTHUM CYLINDRICUM* Millspaugh and Sherff, Field Mus. Bot. 4 : 4, Pl. 3. 1918.

Caulis scabridus, verisimiliter 0.5–1.5 m. altus. Folia magna, quibusdam foliis *Hibisci militaris* Cav. simillima, subdeltaideo-ovata, trilobata (et fere hastata) aut quinquelobata, margine dentata, basi cordata aut subtruncata, membranacea, scabra aut tactui etiam fere levia, setulis adpressis minutis vestita, petiolis adjectis 1.3–2.5 dm. longa, petiolis laminis subaequantibus. Fructuum (Pl. VII., f. 4; Pl. VIII., ff. 16–20) corpus cylindrico-fusiforme, rubro-badium, glandulis minutis punctatum, aliter glabrum, 1.4–1.6 cm. longum et 4–5 mm. crassum; rostris arcuatis, ad apicem hamosis, glabratis, 4–5 mm. longis; aculeis tenuibus, rubro-badiis, ad apicem hamosis, glabratis, 2.5–3.5 mm. longis.

DISTRIBUTION: North Carolina.

SPECIMENS EXAMINED: NORTH CAROLINA: Chimney Rock to Hendersonville, Oct. 3, 1901, J. K. Small and A. M. Huger (Hb. Field 401312, type; Hb. N. Y., cotype).

When this species was originally described, there was no question with us as to the soundness of the policy pursued by certain authors of regarding West Indian and United States specimens of *X. chinense* as specifically distinct. But since then, our studies have convinced us, as stated under *X. chinense*, that the United States specimens formerly referred to *X. americanum* (Auct. amer., *forsan non* Walt.; *X. strumarium* Auct. amer. *ex parte, non* L.; *X. pungens* Wallr.) represent merely an inconstant race or variety of the West Indian and Mexican *X. chinense*. This being true, there arises the question as to whether *X. cylindricum* likewise may not indeed prove to be a race of *X. chinense*. So far, however, we have been unable to find intermediate specimens that seemed to connect adequately with *X. chinense*.¹ Hence we are constrained to reserve judgment in the matter until future studies shall have thrown more light upon the true status of this form.

5. *Xanthium globosum* Shull sp. nov. (*Cf.* Dalbey, Kansas Univ. Science Bull. 9: 57. 1914; Shull, Bot. Gaz. 59: 474–483. 1915.)

Caulis rubro-purpureus aut stramineus, saepe longitudinaliter purpureo-punctatus, 3–10 dm. altus; ramis demum (in speciminibus robustis the second or Mexican form to *X. echinatum* Murr. Clearly, Thellung was totally lacking as to a proper conception of *X. occidentale* (=*X. chinense*), a species that, under various names, has become uniformly recognized in recent decades by prominent American authors as a valid species. Furthermore, even were Thellung's treatment correct and the first *X. chinense* (published in 1768) reduced to synonymy with *X. strumarium* L., then the second *X. chinense* (published in 1771), based according to Thellung upon a different plant and being according to Thellung an entirely different species, would become valid and would take precedence over the name *X. echinatum* Murr. which Thellung maintains (*Cf.* Internat. Rules Bot. Nomencl. art. 50. 1906).

¹ We have found two specimens of *X. chinense* from Missouri (Webber, roadsides, West St. Louis, Oct. 14, 1890, Hb. Mo. 46000 and 85413) that show small leaves suggestive in form and color of the larger ones on *X. cylindricum*.

tis) plus minusve elongatis, imis etiam 1.1 m. longis. Folia non perspicue crassa, subdeltoidea, tri-aut quinquelobata et basi cordata, serrata, utrinque setulis adpressis scabra, petiolis adjectis 0.7–2.3 dm. longa, petiolis laminis subaequantibus. Fructus (Pl. VII., f. 5; Pl. VIII., ff. 21–23) saepe numerosi (circum 1850 in uno specimine observatis, ex littera Shullii); corpore late ovoideo aut subgloboso, vix pubescenti sed glandulis minutissimis numerosis vestito, 0.9–1.1 cm. longo et 4.5–7 mm. crasso; rostris rectis aut non rariter arcuatis, 3–4 mm. longis; aculeis levibus et rectis sed ad apicem hamosis, rostris subaequantibus.

DISTRIBUTION: Missouri and Kansas.

SPECIMENS EXAMINED: MISSOURI: Randolph, "a very common weed," *Kenneth K. Mackenzie* 387 (Hb. Mo. 85408); Jasper County, La Russel, in waste places along railroads and in fields, *Ernest J. Palmer* 1301 (Hb. Mo. 46004 and 756629). KANSAS: Lawrence, breeding grounds of Univ. of Kansas, Sept., 1913, from original plants obtained on northern edge of Wakarusa flood plain about 0.5 km. south of Mount Oread, *Charles A. Shull* (type in Hb. Field 477325); Lawrence, breeding grounds of Univ. of Kansas, Sept., 1917, *idem* (Hb. Field 477328; lineal descendant from type material); Lawrence, in 1917, *idem* (Hb. Field 477326; burs from typical plant growing wild); Lawrence, breeding grounds of Univ. of Kansas, in 1917, *idem* (Hb. Field 477327; burs from lineal descendants of type material).

In 1915, Shull (*loc. cit.*), writing upon the physiological isolation of types in *Xanthium*, described this species. Unfortunately, however, no Latin diagnosis was published (as required by Article 36 of the International Rules of Nomenclature, adopted at Vienna in 1905), and so the name *X. globosum* must be regarded as having been heretofore unbinding and based upon a foundation very insecure. Early in 1918 we took the liberty of writing to Dr. Shull regarding the proper publication of a complete taxonomic description in Latin. Dr. Shull promptly replied in a most cordial manner and very generously placed at our disposal, for publication, not only descriptive notes and photographs, but a sheet of the original type material, also other sheets bearing lineal descendants of the type material etc. We have thought it best to draw up our description rather closely from these sheets, hence a somewhat narrower description has been presented than would have been the case had we included the variations observed in the Missouri specimens.

A study of Shull's several specimens shows a high degree of uniformity among the fruits. The species is probably nearest to *X. chinense* Mill., with which it perhaps intergrades, or hybridizes at times if left to itself. We have seen specimens from Maryland and from Iowa (*G. H. Shull* 392, along shore of Chesapeake Bay, south of Havre de

Grace, Maryland, 2 sheets in Hb. Gray; Hb. Mo. 85399; A. S. Hitchcock, Iowa City, Iowa, without date, Hb. Mo. 85406) which, while referable to *X. chinense*, showed a strong approach, in the subglobose character of the fruits, to *X. globosum*.

6. *XANTHIUM ARCUATUM* Millspaugh and Sherff, Field Mus. Bot. 4: 4. Pl. 2. 1918.

Caulis superne scabridus, 3–5 dm. altus. Folia deltoideo-ovata 3–5-lobata, dentata, basi cordata aut subtruncata, utrinque setulis adpressis scabra, petiolis adjectis circ. 1 dm. longa, petiolis laminis subaequantibus. Fructuum (Pl. VII., f. 6; Pl. VIII., ff. 24–26) corpus anguste ovatum, aculeis numerosis armatum, glandulis multis vestitum, demum 1.3–1.5 cm. longum et 5–6 mm. crassum; rostris rectis aut minime arcuatis, apice hamosis, non pubescentibus sed infra glandulos ferentibus, 3.5–5 mm. longis; aculeis tenuibus, maximam partem arcuatis, plus minusve rubro-purpureo tinctis, apice hamosis, infra glandulosis, 4–6 mm. longis.

DISTRIBUTION: New York.

SPECIMENS EXAMINED: NEW YORK: Chemung County, river shores and low places, Oct. 11, 1896, T. F. Lucy (Hb. Field 4953, type).

A species with burs intermediate between those of *X. chinense* and those of *X. pennsylvanicum*, but having prickles more arcuate. Our failure to find, in various herbaria, additional material matching the type would seem to indicate that either *X. arcuatum* is a very rare species or that it will subsequently prove to be of hybrid origin.

7. *Xanthium curvescens* sp. nov. Pl. XI.

Caulis ramosus, rubens, scaber, $\frac{1}{3}$ dm. altus. Folia deltoideo-cordata, infirme trilobata, margine dentata, scabrida, minute reticulata, punctis glandulosis numerosis minimis punctata, setulis minutis adpressis scabra, non crassa, petiolis adjectis $\frac{1}{2}$ dm. longa, petiolis laminas subaequantibus. Fructuum (Pl. VII., f. 7; Pl. VIII., ff. 27–29) corpus anguste cylindrico-fusiforme, rubro-badium, superne sensim angustatum et in duo rostra distantia productum, exteriore facie 30–50 aculeis armatum, glabratum sed glandulis minutis numerosis punctatum uti bases aculeorum et rostrorum; rostris et aculeis rectis solum inferne, superne valde arcuato-uncinatis; rostris crassioribus et passim paulo longioribus, inferne breviter hispidis; fructus corpore demum 1.3–1.6 cm. longo et 3.5–5 mm. crasso; aculeis 3–6 mm., maximam partem 4.5–5.5 mm. longis.

DISTRIBUTION: Vermont.

SPECIMENS EXAMINED: VERMONT: Orwell, Willard W. Eggleston 1420 (type in Hb. Gray).

Because of its strongly bent prickles and beaks, we were disposed at first to regard this species as a form of the European *X. orientale* L. But in the many fruiting specimens of *X. orientale* examined from

Europe, we have found the fruiting involucres to be not only considerably larger, but brownish rather than reddish, also much more pubescent and the prickles nearly always more numerous. In its narrow, reddish, remotely aculeate fruits, this species suggests the next, *X. leptocarpum*, the type of which was collected likewise in western Vermont, about three years earlier. Indeed, as a species, it seems to lie just half-way between *X. orientale* and *X. leptocarpum*, and for a time we suspected it of being a hybrid between these two species. But the apparent absence of true *X. orientale* from all of North America¹ would seem to

¹ *X. orientale* L. Sp. Pl. Edit. II, 2: 1400 (*ex descript. et synon.; excl. loc.*) 1763; L. fil. Dec. II, Pl. Rar. Hort. Upsal. tab. 17. 1763; Gaertner, Fruct. et Sem. Pl. 2: tab. 164, f. 2. 1791; O. Hoffmann, Engler and Prantl Natürl. Pflanzenfamilien 4^v: 223, f. 112. 1889; *X. elatius & majus Americanum* etc., Morison Pl. Hist. Univ. Oxon. 604, sect. 15, tab. 2, f. 2. 1699; *X. majus canadense* Hermann, Hort. Lugd.-Batav. 635. 1687 (*fide Thellung*); *Lappa canadensis minori* etc., Ray, Hist. Pl. I: 165. 1686 (*fide Thellung*); *X. canadense* Miller, Gard. Dict. Edit. VIII, no. 2. 1768 (*cf. Thellung, Verhandl. Bot. Verein Brandenb.* 50ⁿ: 138. 1908; O. Hoffmann, Engler and Prantl. Natürl. Pflanzenfamilien 4^v: 223. 1889); *X. cuneatum* Moench, Meth. Suppl. 300. 1802 (Moench gave an entirely inadequate description,—“*Xanthium, cuneatum, foliis cuneiformibus subtrilobis*.” He cited, however, “*Xanthium orientale Linnaei*” and “*Xanthium majus Americanum fructu spinulis aduncis armato*. Morison hist. III, p. 604, icon. Sect. 15 t. 2. f. 2” for his two synonyms); *X. echinatum* Wallroth, Monogr. *Xanthium* in Beitr. Bot. 1ⁿ: 239. 1844 (Walpers Repert. Bot. Syst. 6: 152. 1846) non Murray; *X. macrocarpum* DC., Fl. Franc. Suppl. 356. 1815.

At various times in the past, *Xanthium orientale* L. has been reported as occurring in America. Thus, as late as 1913, Britton and Brown (Illustr. Fl. Edit. II, 3: 346) stated that this species was “naturalized in the West Indies.” But an examination of various specimens of *Xanthium* from the West Indies (among them a number from the Herbarium of the New York Botanical Garden, and determined as *X. orientale* L., evidently by Dr. Britton himself), fails to reveal to us a single specimen of *X. orientale*. Indeed, all so-called specimens of *X. orientale* from the West Indies that we have seen are referable to *X. chinense* Miller and differ very markedly from *X. orientale* L.

Great confusion has existed heretofore among many botanists as regards the application of the name *X. orientale*. Linnaeus himself prefaced his original description with three synonyms (“*Xanthium elatius majus americanum, fructu spinulis aduncis munito*. Moris. hist. 3. p. 604. s. 15. t. 2. f. 2. *Xanthium majus canadense*. Herm. lugd. 635. *Lappa canadensis minori* congener sed procerior. Raj. hist. 165”) and with the statement, “Habitat in China, Japonia, Zeylonia.”

If, on the one hand, we consistently follow the custom of taking earliest cited synonyms with which to establish our concept of the species, there can arise practically no doubt. To be sure, Morison's figure has most of the prickles drawn arcuate or even doubly bent, as in European plants of *X. macrocarpum* DC., while his American material must surely have been another species (the Jamaica plants, for example, undoubtedly belonging to *X. chinense* Miller). However, Morison definitely cited the *Lappa Canadensis* material of the Royal Garden of Paris as a basis for his species (“*z. Elatius & majus Americanum, fructu spinulis aduncis armato. Lappa Canadensis minori* congener sed procerior, Hort Reg. Pat. E Virginia, Carolina & Jamaiicensi Insula accepimus. V. icon., tab. aen. 2.”). And (*cf. Thellung, Verhandl. Bot. Verein Brandenb.* 50ⁿ: 138. 1908) this cited material of the Paris Garden was *X. macrocarpum* DC., for in the very year following the publication of Morison's work, Tournefort (Instit. I: 439; 3: tab. 252, f. M. 1700) cited and illustrated this “*Lappa canadensis*” material and his illustration is *positively* of the *X. macrocarpum* DC. Thus, by taking in turn the earliest cited synonym given by Linnaeus and by Morison, we find *X. orientale* L. to be the plant later named *X. macrocarpum* DC. Thellung (*loc. cit.*) has come to the same conclusion and he cites, furthermore, very strong evidence to show that the synonyms of Hermann and Ray likewise belong with the true *X. macrocarpum* DC., i.e., DC. Fl. Franc., *loc. cit.* Later, De Candolle (Prodri. 5: 523. 1836) unfortunately

make an assumption to this effect purely gratuitous. Nor do we feel inclined to regard our plant as an anomalous race or variety of *X. leptocarpum*, since the arcuate character of its prickles is a character that holds with a high degree of uniformity throughout the specimens of the corresponding *X. orientale* of Europe.¹

admitted other, specifically different material to his *X. macrocarpum* and so it is highly important that, for a correct concept of the species, recourse be had only to his original treatment in the *Flore Francaise*. The true *X. macrocarpum DC.* is a plant with strongly hooked beaks and the prickles somewhat subremote, stoutish, tending to be not only hooked at the apex, but also arcuate, often backwardly then forwardly, from about the middle upward.

On the other hand, there is good reason for discarding the Linnaean synonyms entirely, since Linnaeus himself advanced them in an interrogative way. Thus, at the close of his description, he asked the question, "Synonyma americanæ plantæ an differant?" Clearly, Linnaeus did not establish his species upon certain synonyms and then doubtfully refer the plant under observation to it; but he did base his species upon the plant material studied, drawing up a (for that period) good description of it, and then to this species the interrogative mark and the wording of the question show that he doubtfully referred the early synonyms. (This point is indeed important, for in case a discrepancy did exist between the synonyms and the plant of the description, it is evident that Linnaeus definitely advanced the description and not the synonymy. But, fortunately, no such discrepancy appears to have existed.)—Linnaeus' doubts were evidently inspired by the fact that the cited references, although agreeing with his plant, all had been regarded as pertaining to American material. If we note his own citation of habitat, we find that he regarded his *Xanthium orientale* as belonging to China, Japan and Ceylon. But, it happens that his description is illuminated by a good, clear illustration published the same year (1763) by his son, from plants at the Garden of Upsala. This illustration is very decisive. It shows the Linnaean plant material of *X. orientale* to have been a European plant (*X. macrocarpum DC.*), a plant that we have never known to come from the Orient.

In 1815, De Candolle (*loc. cit.*) created the name *Xanthium macrocarpum* as a straight synonym for the Linnaean description of *Xanthium orientale* and for the illustration by Linnaeus' son. He was impelled to create the new name *X. macrocarpum* because the species had not been proved to grow in the Orient and because, even if it had, the name *orientale* would be hardly appropriate, since the plant had been collected in Languedoc: "La description de Linné, la description et la figure de Linné fils se rapportent parfaitement à notre plante; malgré cela j'ai cru convenable de ne pas lui conserver le nom *d'orientale*, 1^o parce qu'il n'est pas prouvé que cette plante croisse en Chine, au Japon, à Ceylan; 2^o parce que cette habitation supposée certaine, le nom *d'orientale* ne serait guère convenable, l'espèce se trouvant en Languedoc. O Elle a été trouvée dans les vignes du bas Languedoc, par mademoiselle Lucie Dunal." (Among various authentic French specimens of this species we have seen an old one from De Candolle himself, collected in this same region, at Montpellier. It is in the Torrey Herbarium, now at the Herbarium of the New York Botanical Garden.)

De Candolle's procedure in seeking to supplant the name *X. orientale* with the name *X. macrocarpum* would not, of course, be sanctioned by the Vienna Code (Internat. Rules Bot. Nomencl., art. 50. 1906), and clearly the name *X. orientale* L. must be retained.

Our search through botanical literature fails to show any true *X. orientale* to have been collected in North America during recent times (*Cf. Thellung, loc. cit. 141: "Indessen ist das echte X. orientale aus Nord-Amerika, wenigstens in neurerer Zeit, nicht mit Sicherheit bekannt geworden."*)

¹ On the eve of publication, we have received an admirable set of specimens collected for us by Mrs. Nellie F. Flynn at Burlington, Vermont. The set includes *Xanthium chinense*, *X. speciosum*, *X. italicum*, *X. leptocarpum* and *X. curvescens*. We have deposited the material of *X. curvescens* in Hb. Field, nos. 481623, 481624, 481625, 481626, 481627, 481630; Hb. Gray; Hb. N. Y. Its burs show a curious simulation of those of *X. orientale* L., but are much smaller. It was found growing with *X. italicum* and *X. leptocarpum*. This fact naturally leads to the inquiry as to whether or not *X. curvescens* may ultimately prove to be of hybrid origin.

8. *XANTHIUM LEPTOCARPUM* Millspaugh and Sherff, Field Mus. Bot. 4: 3, Pl. I. 1918.

Caulis superne scaber, 3–5 dm. altus. Folia plus minusve deltoidea et trilobata, dentata, basi cordata aut subtruncata, utrinque setulis adpressis scabrida, petiolis adjectis 7–19 cm. longa, petiolis laminis subaequantibus. Fructuum (Pl. VII, f. 8; Pl. VIII, ff. 30–32) corpus anguste cylindrico-fusiforme, badium, superne sensim angustatum; exteriore facie et basibus aculeorum et rostrorum pubescentibus, glandulosis; 18–40 aculeis remotis, 2–3 aut rare –4 mm. longis; rostris distantibus, arcuatis; rostris et aculeis ad apicem hamosis, rostris crassioribus et paulo longioribus; fructus corpore 1.3–1.6 cm. longo, 3.5–5 mm. crasso.

DISTRIBUTION: Vermont.

SPECIMENS EXAMINED: VERMONT: Burlington, Sept. 12, 1896, L. R. Jones (Hb. Field 430860, type); Shores of Lake Champlain, Oct. 30, 1895, and Sept. 8, 1896, Ezra Brainerd (Hb. Gray).

This species appears most closely allied with *X. Wootoni* Cockll. Careful comparisons, however, of the type and supplementary material with authentic specimens (cited below) of *X. Wootoni* do not permit us to equate the two species. The burs of *X. leptocarpum* are uniformly much narrower; moreover, they have about twice as many prickles as do those of *X. Wootoni* and their beaks show no tendency to be more or less cleft.¹

9. *XANTHIUM WOOTONI* Cockerell ex De Vries, Sp. and Var. 140. 1905;²
cf. Proc. Biol. Soc. Wash. 16: 187. 1903.

X. commune var. *Wootoni* Cockerell, *ibid.*, p. 9. 1903.

X. Wootoni Auct. ex Index Kew. Suppl. 3: 191. 1908.

X. oligacanthum Piper, Contrib. U. S. Nat. Herb. 11: 551. 1906.³

Caulis erectus aut sese extendens, sparsim scabrido-hispidus, 3–6 dm. altus. Folia reniformi-orbiculata aut deltoideo-cordata, obscure lobata, crenato-dentata, setulis minutis adpressis scabrida, petiolis adjectis 0.8–1.5 dm. longa, petiolis laminas aequantibus aut paulo excedentibus. Fructuum (Pl. VII, f. 9; Pl. VIII, ff. 33–36) corpus oblongum, vel stramineum vel badium vel etiam rubro-fuscum, superne sensim angus-

¹ See also footnote (p. 27) under *X. curvescens*.

² See also Science, New Series, 42: 871. 1915.

³ We have purposely given the synonymy as fully as we can. Cockerell originally proposed the plant as a variety. But, in accordance with their entirely unjustified method of indexing varieties, subspecies etc., as species, the Biological Society of Washington indexed the plant at the back of their volume as a species. In 1905, De Vries (*loc. cit.*) first stated the binomial at all creditably and he definitely attributed the name to Cockerell. As the retention of a multitude of taxonomic binomials, each accredited merely to some anonymous author (*e.g.*, "*Auct.*" in Index Kew. *loc. cit.*) can result only in endless confusion in the future, we feel ourselves in accord with the spirit of the Vienna Code (Internat. Rules Bot. Nomencl., art. 4: 2. 1906) in taking De Vries' book as the place of valid publication.

tatum et in duo (aut rarius tria) rostra distantia productum, 12–30 aculeis (3.5–6 mm. longis) armatum, molliter glanduloso-pubescentes uti bases aculeorum et rostrorum, 1.1–1.4 (rariter 1.6) cm. longum et 5–6 (–7, fide Piperi) mm. crassum; rostris rectis aut versus apicem incurvatis, saepe hiantibus et achaenia in conspectu ponentibus, aculeos aequantibus; aculeis rectis aut subrectis sed ad apicem hamosis, non pubescentibus nisi versus basim.

DISTRIBUTION: Massachusetts, New Mexico and Washington.

SPECIMENS EXAMINED: MASSACHUSETTS: South Boston, made land, Oct. 4, 1909, *Walter Deane* (2 sheets, Hb. Gray). NEW MEXICO: Las Vegas, *T. D. A. Cockerell* 15 (author's material of *X. commune Wootoni* Cockerell, Hb. N. Y.); Las Vegas, in 1902, *idem* (author's material of *X. commune Wootoni* Cockerell, Hb. Gray). WASHINGTON: Waitsburg, bars of streams, *Robt. M. Horner* B. 272 (Hb. Gray); Bolles, in fields, Sept. 18, 1893, *C. V. Piper* (Hb. N. Y.; cotype of *X. oligacanthum* Piper).

Repeated studies upon this species have indicated it to be distinct and worthy of specific rank. DeVries (*loc. cit.*) found that the seed sent him by Cockerell (who was the first to pay particular attention to the plant) produced, when planted in DeVries' garden, plants true to type. Wooton and Standley (*Contrib. U. S. Nat. Herb.* 19: 635. 1915), while reluctantly retaining the form as a variety of *Xanthium commune* Britton (= *X. italicum* Moretti), state nevertheless that it "seems distinct enough from *X. commune* to be regarded as a species. It certainly is more easily separable from that than are most of the eastern species from each other. . . . Ordinarily the two plants are distinct enough." Cockerell himself (*Science, New Ser.* 42: 871. 1915), although at first inclined to regard the plant as a variety, finally, as a result of an additional observation upon *X. commune* and also in view of DeVries' results, stated, "We must apparently conclude that *X. Wootoni* is a valid species, but that *commune* from time to time varies or mutates to a virtually identical form." And, several years before, Piper regarded it as a species. He stated that it differed "from any other American species in the small size of the fruit and the relatively few prickles" (*Piper, loc. cit.*). But, as he was dealing with specimens from Washington, he apparently overlooked the literature dealing with *X. Wootoni*, which had been known only from New Mexico;—hence the reason for his name *X. oligacanthum*.

We have studied several authentic specimens from New Mexico and from Washington. There is no essential difference to be found between the two sets of specimens. Those from Washington have burs more brownish in color (rather than whitish to straw-colored) and the prickles are very slightly stouter. But both have the beaks of the burs tending

to be strongly cleft or 2-valved (sometimes more or less malformed),¹ and in various other characters are too close to admit of any taxonomic separation.

The specimens collected by Deane in Massachusetts have the numerous burs identical with those on Piper's plant from Washington, but the leaves differ noticeably in being sharply lobed and dentate. Our knowledge of the genus, however, convinces us that the foliage characters are entirely too unstable to warrant satisfactory segregation of forms when unaccompanied by definite characters of the fruits. Hence we must refer the Massachusetts plants to this species.

10. *Xanthium cenchroides*, sp. nov.

Caulis longitudinaliter plus minusve purpureo-maculatus, supra subscabridus. Folia non crassa, dentata, supra scabrida, infra scabra et minute reticulata. Fructus (Pl. VII, f. 10; Pl. VIII, ff. 37-39) ovati, superne in duo rostra producti; exteriore facie glanduloso-hispida et circum 25 aculeis armata; corpore (rostris non adjectis) 1.5-1.7 cm. longo et 6-7 mm. lato; rostris arcuatis, infra hispidis, supra glabratis et ad apicem hamosis, circum 8 mm. longis; aculeis rectis aut subrectis, infra hispidis, supra glabris et ad apicem hamosis, 8-10 mm. longis.

DISTRIBUTION: Texas.

SPECIMENS EXAMINED: TEXAS: near Ferris, *J. Reverchon* 2332 (type in Hb. Mo. 85563; additional material, *ibid.*, on sheet no. 85564).

The type material is very fragmentary, the leaves nearly all having been destroyed by worms. The fruiting burs, however, are present in fair quantity and are very distinct from those of any other *Xanthium* known to us. In their small number of prickles, the burs resemble those of *X. Wootoni* Cockll., but in size of body, length of prickles etc., there are very pronounced differences. The burs suggest very strongly the fruiting involucres of *Cenchrus carolinianus* Walt., although of course much larger.

11. *XANTHIUM INFLEXUM* Mack. and Bush, Rept. Missouri Bot. Gard. 16: 106. 1905.

Caulis glabratus aut superne setulis albis plus minusve scabridus, ramosus, 1-1.5 m. altus. Folia cordata aut ovato-cordata, tri-aut subquinquelobata, irregulariter serrata aut dentata, infirme aut valide scabrida, petiolis adjectis 0.8-2.5 dm. longa, petiolis laminis subaequantibus. Fructuum (Pl. VII, f. 11; Pl. IX, ff. 1-4) corpus oblongo-ellipticum aut ovato-oblongum, exteriore facie non paucis aculeis armatum, aliter glabrum aut sparsim glandulosum, 1.3-1.7 (-2) cm. longum et 6-7.5 mm. crassum; rostris validis, maturis ad medium abrupte flexis, valde incurvatis, ad apicem hamosis, saepe mutuo contingentibus, infra

¹ The specimen collected by Piper has several burs with the achenes protruding at the top.

glandulos-pubescentibus, plerumque 5–7 mm. longis (auctores “circ. 10 mm. longis” dixerunt inaccurate); aculeis tenuibus, subconfertis, plerumque arcuatis, ad apicem hamosis, infra glandulos-pubescentibus aut demum glabratris, 4.5–6.5 mm. longis, saepe quibusdam abnormalibus versus rostra longissimis (8–10 mm.).

DISTRIBUTION: Southwestern Illinois to Arkansas.

SPECIMENS EXAMINED: MASSACHUSETTS: Cambridge, Botanical Garden, Oct., 1848, from seed collected by Engelmann (presumably collected the preceding year at East St. Louis, Illinois) Asa Gray (two sheets in Hb. Gray, bearing nos. 172, 172a and 174). ILLINOIS: East St. Louis, river bank, Sept., 1847, George Engelmann (Hb. Mo. 85551); MISSOURI: Courtney, in bottoms, B. F. Bush 869 (Hb. Gray; Hb. Mo. 85519; an atypic form apparently hybridized with *X. pennsylvanicum* Wallr.); Courtney, in bottoms, *idem* 1804 and 1805 (Hb. Mo. 85409 and 85531 respectively); Courtney, in bottoms, *idem* 1806 (Hb. Mo. 85522; Hb. Gray); Courtney, in bottoms, *idem* 1916 (Hb. Mo. 85520 and 85521; Hb. Gray; — type material). ARKANSAS: Fulton, along river, B. F. Bush 1026 (Hb. Mo. 85554 and 85555; Hb. Gray; — a form approaching *X. pennsylvanicum* Wallr., the burs having long, somewhat delicate beaks, which are not decidedly inflexed).

Fortunately, we have been able to examine fairly numerous specimens of this little known species. The burs have a body averaging of larger size than in *X. chinense* Mill.; in shape and appearance the body is intermediate between that in *X. chinense* Mill. and that in *X. pennsylvanicum* Wallr. The prickles are long, as in *X. speciosum* Kearney, but more slender, much smoother and somewhat less abundant.

12. *X. PENNSYLVANICUM* Wallr.¹ Beitr. Bot. II: 236. 1844.; Britton and Brown Illustr. Fl., Edit. II, 3: 346, f. 4137. 1913.

X. pennsylvanicum vars. *glandulosum* and *eglandulosum* Wallr. loc. cit.

X. saccharatum Wallr. loc. cit. 238;

X. affine Greene, Pittonia 4: 60. 1899.

X. californicum Greene and *X. acutum* Greene, loc. cit. 62.

Caulis subtenuis scabridus, aut infra levis, 3–9 dm. altus. Folia deltoideo-ovata aut cordata, dentata, saepe acute 3–5-lobata, utrinque setulis minutis adpressis scabra, petiolis adjectis 0.7–2 dm. longa, petiolis laminas subaequantibus aut excedentibus. Fructuum (Pl. VII, f. 12; Pl. IX, ff. 5–10) corpus nunc anguste cylindricum, nunc oblongum, nunc ovato-fusiforme, nunc etiam ovoideum, sed plerumque plus minusve cylindricum, glabrum aut glabratum aut pilis glandulosis brevibus vestitum, 1–2 cm. longum et 5–8 mm. crassum, aculeis armatum; rostris tenuibus aut crassis, infra glandulos-pubescentibus, versus

¹ The name as originally given by Wallroth was spelled *X. pensylvanicum*. Fernald (*Rhodora* 19: 70. 1917) is inclined to retain the old spelling, in such cases and gives the historical reasons for pursuing such a course.

apicem glabris et saepius incurvatis, ad apicem hamosis, 4–6 mm. longis; aculeis subremotis et subvalidis (aut rarius confertis et tenuibus), versus basim glandulosis et saepe sparsim pubescentibus, aliter glabris, ad apicem hamosis, interdum purpureo-tinctis, 3–7 mm. longis.

DISTRIBUTION: Massachusetts, Ontario and Washington to Florida, Texas and California; perhaps also in Mexico; frequent in the Hawaiian Islands.

SPECIMENS EXAMINED (partial list):¹ MASSACHUSETTS: Boston, Sept. 13, 1895, *Emile F. Williams* (Hb. Gray). RHODE ISLAND: Newport, waste ground, *Fernald and Long* 10658 (Hb. Gray). PENNSYLVANIA: without locality, invading the marshes ("in paludos"), Sept., 1824, *Poeppig* (Hb. Mo. 85594; cotype of *X. pennsylvanicum* var. *eglandulosum* Wallr.). MARYLAND: Plummer's Island, near Cabin John, *T. H. Kearney* 221 (Hb. U. S. 640384); east shore of Maxwell's Point, above tide, *George H. Shull* 332 (Hb. Gray); shore of Chesapeake Bay, south of Havre de Grace, *idem* 390 (Hb. Gray; Hb. Mo. 85436). VIRGINIA: Alexandria County, near Barcroft Station, Oct. 3, 1915, *E. S. Steele* (Hb. U. S. 643281). FLORIDA: Hillsborough County, waste ground, *A. Fredholm* 6426 (Hb. Gray). ONTARIO: near Sarnia, roadside ditches, *C. K. Dodge* 49 (Hb. Gray). MICHIGAN: Port Huron, dryish ground in streets, *C. K. Dodge* 47 (Hb. Gray). ILLINOIS: near French Village, Sept. 6, 1892, *H. Eggert* (Hb. Mo. 85438); East St. Louis, Sept., 1847, *Dr. George Engelmann* (Hb. Mo. 85452); Carthage, *F. C. Gates* 9996 (Hb. Field 472736); vicin. of Catlin, bank of creek, *O. E. Lansing, Jr.*, 3532 (Hb. Field 346590); Urbana, open wet soil, Sept. 19, 1901, *M. S. Sheldon* (Hb. Gray); Chicago, along walk, *Earl E. Sheriff* 3080 (Hb. Field 480737 and 480738); Hinsdale, waste ground, *Ernest C. Smith* 529, (Hb. Field 127018). KENTUCKY: locality not stated, in 1842, *Dr. C. W. Short* (Hb. Gray). IOWA: Decatur County, in fields, Aug. 29, 1897, *Fitzpatrick and Fitzpatrick* (Hb. Gray); Ames, without date, *A. S. Hitchcock* (Hb. Mo. 85450). MISSOURI: Courtney, in bottoms, *B. F. Bush* 870 (Hb. Mo. 85539); Courtney, in bottoms, *idem* 1789 (Hb. Gray); Courtney, in bottoms, *idem* 1790 (Hb. Mo. 85538); Courtney, in bottoms, *idem* 1792 (Hb. Mo. 85530); Courtney, in bottoms, *idem* 1793 (Hb. Mo. 85542); Courtney, in bottoms, *idem* 1794 (Hb. Mo. 85529); Courtney, in bottoms, *idem* 1802 (Hb. Gray; Hb. Mo. 85602); Courtney, in bottoms, *idem* 1809 (Hb. Mo. 85541); Courtney, in bottoms, *idem* 1911 and 1914 (Hb. Mo. 85540 and 85533 respectively; probably hybridized with *X. chinense* Miller); Courtney, in bottoms, *idem* 1915 (Hb. Mo. 85537); St. Louis, Aug. 25, 1874, *H. Eggert* (Hb. Gray); St. Louis County, West Webster, *Dr. J. M. Greenman* 3799 (Hb. Mo. 807756);

¹ A large number of specimens omitted here from lack of space.

Webb City, low ground, *E. J. Palmer* 767 (Hb. Mo. 756626); La Russell, low ground, *idem* 1300 (Hb. Mo. 85456; fruit with bristly prickles and approaching that of *X. italicum* Mor.). ARKANSAS: Fulton, along river, *B. F. Bush* 1027 and 1028 (Hb. Mo. 85423 and 85543 respectively). NORTH DAKOTA: Leeds, waste places, Aug. 21, 1902, *Dr. J. Lunell* (Hb. Gray). NEBRASKA: Red Cloud, *Rev. J. M. Bates* 4745 (Hb. Gray). KANSAS: Manhattan, Sept. 20, 1887, *W. A. Kellerman* (Hb. Mo. 85449); Riley County, low ground, *J. B. Norton* 261 (Hb. Mo. 85448). OKLAHOMA: Sapulpa, *B. F. Bush* 299 (Hb. Mo. 85544); vicin. Ottawa, low waste place, *G. W. Stevens* 2568 (Hb. Gray). TEXAS: Columbia, in sand, *B. F. Bush* 1344 (Hb. Mo. 85467); Dallas, in wastes, *J. Reverchon* 2589 (Hb. Mo. 85480, 85481 and 85546). COLORADO: Naturita, moist ditch bank, *Ernest P. Walker* 545 (Hb. Gray; Hb. U. S. 544637). NEVADA: Washoe County, Truckee Pass, Sept. 15, 1909, *A. A. Heller* (Hb. Calif. 196027; a form with burs precisely like those on type of *X. acutum* Greene at Hb. Greene, except slightly pubescent). IDAHO: New Plymouth, waste ground, *J. Francis Macbride* 718 (Hb. Gray, having burs almost exactly identical with those on type of *X. acutum* Greene, in Hb. Greene; a rather immature specimen is also in Hb. Mo. 85515). UTAH: Vermilion, *Marcus E. Jones* 5842 (Hb. Mo. 85490 and 85492); Peterson, Peterson Canyon, *Pammel and Blackwood* 3888 (two sheets in Hb. Gray); road between Monticello and Bluffs, *Rydberg and Garrett* 9872 (Hb. U. S. 765345). ARIZONA: Tucson, Valley of Santa Cruz River, *John J. Thornber* 8 (Hb. Mo. 85496; Hb. Calif. 129897). WASHINGTON: Waitsburg, bars of streams, *Robt. M. Horner* B 273 (Hb. Gray; this is not *X. varians* Greene as erroneously stated by Piper, Contrib. U. S. Nat. Hb. 11: 551. 1906); West Klickitat County, sandy banks of Columbia River, *W. N. Suksdorf* 1584 (Hb. Field 89752 and 89753; Hb. Calif. 130204; Hb. Gray; Hb. Greene 19830; type and cotypes of *X. affine* Greene). OREGON: Union County, Snake River, sand-bars, *W. C. Cusick* 1000 (Hb. Gray); near Prineville, *J. B. Leiberg* 842 (Hb. Gray). CALIFORNIA: Los Angeles County, near Soldiers' Home, Sept., 1905, *Dr. J. Q. Adams* (Hb. Calif. 74043); San Diego County, vicin. Ramona, Stockton Ranch, Oct., 1905, *Katharine Brandegee* (Hb. Calif. 168741; burs identical with those on type and cotypes of *X. affine* Greene); vicin. Ramona, Stockton Ranch, Oct., 1905, *eadem* (Hb. Calif. 168816; a form with burs matching those on type of *X. californicum* Greene in Hb. Greene); vicin. Ramona, Stockton Ranch, Oct., *eadem* (Hb. Calif. 168813); vicin. Mendocino, *H. E. Brown* 938 (Hb. Mo. 85391; this is not *X. echinatum* Murr., as erroneously stated by Thellung, Verhandl. Bot. Verein Brandenb. 50^{II}: 144. 1908); roadside near Yreka, *George D. Butler* 527 (Hb. Calif. 164145); Escondido, *Harley P. Chandler* 5399

(Hb. N. Y.); Temescal, Oct., 1889, *Edward L. Greene* (Hb. Greene 19822; Greene's only specimen of his *X. californicum* and by us regarded as the type; matched most minutely by W. L. Jepson's plant from Oakland,— see below); Amador County, Middle Fork, *George Hansen* 700 (Hb. Mo. 85389); Suisun Marsh, along railroad near Suisun, *A. A. Heller* 7550 (Hb. Gray; Hb. Mo. 85386; Hb. N. Y.); cultivated land, north of Oroville, *idem* 12647 (Hb. Field 460600; Hb. Mo. 802978; atypical and approaching *X. italicum* Mor.); Rio Vista, bank of Sacramento River, Sept. 16, 1891, *W. L. Jepson* (Hb. Calif. 36799; this is a form intermediate between the types of *X. acutum* Greene and *X. californicum* Greene, in Hb. Greene); Oakland, Oct. 1, 1894, *idem* (Hb. Mo. 85387; the exact form described by Greene as *X. californicum* and important as coming from the range emphasized by him, "Middle California, especially about San Francisco Bay"); near San Francisco, in 1866, *Dr. A. Kellogg* (Hb. Gray); near Stockton, in 1888, *J. A. Sanford* (Hb. Greene 19819; type of *X. acutum* Greene).

Wallroth divided this species into two varieties, *a. glandulosum* and *b. eglandulosum*, according to the presence or absence of minute glands upon the fruits and lower surfaces of the leaves. The var. *glandulosum* was collected by Beyrich at Asheville [North Carolina] in 1833, while the var. *eglandulosum* was collected by Poeppig in Pennsylvania, Sept., 1824. We have not seen type material of var. *glandulosum*; of var. *eglandulosum*, however, we have seen the cotype specimen in the Bernhardi Herbarium (Hb. Mo. 85594). But this shows clearly, under a lens with a magnification of fourteen diameters, many minute glands,— evidently missing on the type or perhaps overlooked by Wallroth. Thus Wallroth's separation of the species into two varieties is seen to be without real basis in fact.

Among botanists there has been almost endless confusion between *X. pennsylvanicum* and the species treated below as true *X. italicum* Mor. Our own experience in the herbarium indicates these to be, without question, distinct. In the field, our numerous observations during the season of 1918 show that, where the two grow side by side, *X. italicum* commonly displays a more compact mass of burs near the apex of the stem and branches than does *X. pennsylvanicum*. This compactness, added to the greater pubescence of the burs, often imparts to *X. italicum* an appearance very unique.

Of *X. saccharatum* Wallr., there is the cotype in Gray Herbarium. This is plainly *X. pennsylvanicum*. We find a badly scrawled name given for the locality to say "Bexar." Clearly the plant (*Berlandier* 1865) was collected at Bexar, Texas, and not in Mexico as some writers have persisted in stating (although, to be sure, Texas had been a part

of Mexico until shortly before Wallroth's publication of the name *X. saccharatum*).¹

Of *X. affine* Greene, *X. californicum* Greene² and *X. acutum* Greene, we have seen the types (all in Hb. Greene); of *X. affine* we have seen also various cotypes. So different do these forms appear at first that one might well mistake them as typifying three distinct species. However, the large number of herbarium specimens that we have examined from the Pacific Coast show that specific segregation is entirely impossible. So polymorphous does *X. pennsylvanicum* become in its western range that, in California alone, as many as six or seven forms may be found. In the eastern part of the United States, *X. pennsylvanicum* displays much less variation, both in fruits and in general habit.

13. *Xanthium calvum* sp. nov. Pl. XII.

Caulis erectus, rubescens, saepe maculis purpureis parvis longitudinalibus punctatus, subscabridus aut infra etiam glaber, circ. 4–9 dm. altus. Folia ovato-cordata aut ovato-triangulata, ad basim vel orbiculata vel truncata vel cordata, plerumque atro-viridiora, crenato-dentata, saepe dentato-lobata, setulis minutis adpressis scabrida, petiolis adjectis 0.6–2 dm. longis, petiolis laminis subaequantibus. Fructus (Pl. VII, f. 13; Pl. IX, ff. 11–12) pauci aut numerosi, corpore crasso ovato-fusiformi fusco, utrinque subacuto, exteriore facie breviter et minime pubescenti, glanduloso, aculeis subremotis armato, 1.5–1.8 cm. longo, circum 8 mm. crasso; rostris infra crassis et validis, ad basim glandulosopubescentibus, ad medium plerumque inflexis, ad apicem plus minusve hamosis, 3–5 mm. longis; aculeis rectis, ad basim glandulosis aut rariter pubescentibus, aliter glabris, ad apicem hamosis, 4–6 mm. longis; rostris et aculeis plerumque purpureo-tinctis, praesertim versus apicem.

DISTRIBUTION: California.

SPECIMENS EXAMINED: CALIFORNIA: vicin. of Palo Alto, foothills, C. F. Baker 1760 (Hb. Calif. 131236, type; Hb. Field 226601; Hb. Gray; Hb. Mo. 85385; Hb. N. Y.); Neponset, Salinas River, L. R. Abrams 4023 (Hb. Calif. 149139); West Berkeley, Harriet A. Walker 478 (Hb. Calif. 130051).

¹ It may be remarked that the type of *X. crassifolium* Millsp. and Sherff (Field Mus. Bot. 4: 5. 1918) was collected at San Antonio, not far from Bexar, in Bexar County, Texas. The two plants show a close resemblance, but the Berlandier plant is much thinner-leaved and less scabrous. We are disposed to consider *X. crassifolium* as probably a variety or race of *X. pennsylvanicum*, — a conclusion that we have reached also in the case of *X. acutilobum* Millsp. & Sherff (*loc. cit.*, p. 6). Since describing *X. crassifolium* (Field Mus. Bot. 4: 4. 1918) we have found several somewhat intermediate herbarium specimens. One of these, C. L. Shear 220, vicin. of Osborne City, Kansas, Aug. 27, 1894 (Hb. Gray), has the coarse, highly scabrous stem and leaves of *X. crassifolium*, but the leaves are large, as in *X. pennsylvanicum*.

² At various times in later years, Dr. Greene erroneously determined certain specimens of *Xanthium* as representing his *X. californicum*. These belonged to *X. pennsylvanicum*, *X. calvum*, etc. Greene's own type specimen of *X. californicum* was, as stated above, the same form as that collected by W. L. Jepson, Oakland, California, Oct. 1, 1894 (Hb. Mo. 85387), a form of *X. pennsylvanicum*.

A species with very unique aspect of foliage as well as of fruit. Specimens of the type collection had been determined by E. L. Greene as *X. californicum* Greene (*cf.* p. 35, footnote 2). But a study of Greene's type of *X. californicum* shows no approach in fruit characters to the type of *X. calvum*. We have seen several sheets of *X. pennsylvanicum* having fruits typical of that species but with foliage offering a perplexing resemblance to that of *X. calvum* (*e.g.*, C. F. Baker 1512, along borders of marshes, Palo Alto, California, Hb. Gray; Harley P. Chandler 5399, Escondido, California, Hb. Calif. 64835). Future investigation upon the status of such forms, which are possibly hybrids, would seem highly desirable.

The specific designation *calvum* is given in allusion to the bald or smoothish appearance of the body and prickles of the mature fruit.

14. XANTHIUM PALUSTRE Greene, Pittonia 4: 63. 1899.

Caulis glaber aut paulo scabridus, interdum rubescens, saepe lineis purpureis longitudinalibus maculatus, verisimiliter 0.5-1 m. altus. Folia ovato-cordata aut deltoidea, dentata, plus minusve lobata, utrinque setulis minutis adpressis scabra, petiolis adjectis 0.8-3 dm. longa, petiolis laminas subaequantibus aut excedentibus. Fructuum (Pl. VII, f. 14; Pl. IX, ff. 13-15) corpus viridi-fuscum, demum crasso-oblongum et nitens, glandulosum sed parce pubescens, circ. 1.8 cm. longum et 8-9 mm. crassum, aculeis brevibus armatum; rostris brevibus, crassis, pubescentibus, supra incurvatis, ad apicem saepe subhamosis, 3-5 mm. longis; aculeis numerosis sed vix confertis, versus basim crassum glandulosum et saepe sparsim pubescentibus, supra tenuibus et glabris, ad apicem hamosis, 2-2.5 (rariter 3-3.5 aut etiam -4) mm. longis.

DISTRIBUTION: California.

SPECIMENS EXAMINED: CALIFORNIA: Suisun Marsh, in 1893, *Edw. L. Greene* (Hb. Greene 19833 and 19834; type sheets); Lathrop, *Harriet A. Walker* 926 (Hb. Calif. 201224); Suisun, *eadem* 973 (Hb. Calif. 128022).

In Greene's Herbarium are two specimens to represent this rare and little known species, both of them collected by Greene himself at Suisun Marsh, and which may properly be taken as the types of the species. These have fruits just as described by Greene, except that they are more nearly oblong than he implied and had best not be described as "slightly obovate-oblong." Furthermore, they tend toward a greenish-brown in color, with some of the prickles becoming reddish.

The first specimen by Miss Walker (listed above) is, in our opinion, clearly *X. palustre*, but it shows an approach toward *X. pennsylvanicum* Wallr. in having prickles 3-3.5 (a few even 4) mm. long. Miss Walker's second specimen (no. 973), however, comes from the type locality and matches the two type specimens identically, both as to foliage and as to fruits.

15. *Xanthium australe* sp. nov. Pl. XIII.

Caulis scabridus, plus minusve maculis purpureis parvis linearibus punctatus, verisimiliter 0.5-1 m. altus. Folia petiolata, trinervia, deltoideo-cordata, saepe obscure lobata, dentata, utrinque setulis minutis adpressis vestita, petiolis adjectis 0.8-2 dm. longa, petiolis laminis subaequantibus. Fructuum (Pl. VII, f. 15; Pl. IX, ff. 16-18) corpus ovoideo-subglobosum, subsparsim glanduloso-pubescentis aut glabratum, 0.9-1.1 cm. longum et 6-7 mm. crassum (aut etiam 1.3-1.5 cm. longum et 8-9 mm. crassum, in specimine chilensi), aculeis confertis armatum; rostris attenuatis, rectis aut paulo inflexis, ad apicem subrectis aut uncinatis, infra pubescentibus, 6-9 mm. longis; aculeis tenuibus, rectis aut paulo arcuatis, infra nec dense nec longe pubescentibus (in specimine chilensi quibusdam aculeis glandulosis et non pubescentibus), supra glabris, ad apicem uncinatis, 4-5 mm. longis.

DISTRIBUTION: Mexico, Paraguay and Chile.

SPECIMENS EXAMINED: TAMAULIPAS: vicin. of La Barra, 8 km. east of Tampico, at sea-level, Dr. Edward Palmer 275 (Hb. U. S. 463216, type). PARAGUAY: Asuncion, Thomas Morong 807 (Hb. N. Y.). CHILE: Valparaiso, Dr. Mertens (ex Hb. Acad. Petrop., in Hb. Gray).

The long fruiting beaks of this species suggested to us at first an affinity with the long-beaked West Indian form of *X. chinense* Mill. (*X. longirostre* Wallr.). A consideration, however, of the other fruit characters, as well as of foliage, shows no further relationships of a specific nature.

There is a slight possibility that this is the species which Vellozo had in mind when figuring his *Xanthium brasiliicum*. But a careful inspection of Vellozo's plate (Fl. Flum. 10: tab. 23. 1827) shows it to be all too crude and lacking in definite detail to permit of satisfactory interpretation.¹ Indeed, if the plate be at all accurate, it clearly represents some other species, for the characters of the bur as there shown are not those of *X. australe*.²

¹ It is surprising to find that Baker (Martius Fl. Bras. 6th: 147. 1884), notwithstanding the crudity of this plate, actually made it the basis for a new combination in nomenclature, *X. strumarium* L. var. *brasiliicum* (Velloz.) Baker.

² We have seen no authentic material of the inadequately described *X. homothalamum* of Sprengel (Neue Entdeck. 1: 259. 1820) from Brazil. We note that the name *X. homothalamum* was entirely omitted by Baker from his treatment of Brazilian *Xanthia* (Martius Fl. Bras. 6th: 147. 1884). Sprengel himself appears to have seen only scanty material of the plant ("Licit haut perfecta huius plantae exemplaria investigare potuerim," loc. cit., p. 260). He described the fruits briefly: "In ambitu sex aut octo drupae oblongae sulcatae, aculeis flavis uncinatis armatae. Singulae continent semen testa fusco-nigra obductum, in quo, sine albumine, embryo rectus oblongis cotyledonibus mediocriter carnosus, sedet." We find nothing in his description which might justify the reference of our *X. australe* to *X. homothalamum*.

16. *XANTHIUM ECHINATUM* Murr., Comm. Goetting. 6: 32 and tab. 4.

1783–1784.

X. maculatum Raf., Amer. Journ. Sc. 1: 151. 1819.¹

Caulis scaber aut scabrido-hispidus, purpureo-maculatus, 3–6 dm. altus. Folia setulis adpressis scabra, plerumque cordata et obtuse lobata, obtuse et remote dentata aut serrata, petiolis adjectis 0.6–2.3 dm. longa, petiolis laminas subaequantibus aut excedentibus. Fructuum (Pl. VII, f. 16; Pl. IX, ff. 19–21) corpus crasso-ovale aut rare sub-globosum, glanduloso-hispidum et aculeis subremotis armatum, demum 1.6–2 cm. longum et 0.8–1 cm. crassum; rostris validis, incurvatis, ad apicem saepius hamosis, infra hispidis, 3–5 mm. longis; aculeis tenuibus, rectis aut arcuatis, ad basim (aut usque ad medium) hispidis, supra calvis, ad apicem saepius hamosis, rostris subaequantibus.

DISTRIBUTION: Quebec to New Jersey, also (apparently adventive) in Virginia, Ontario, North Dakota and Missouri.

SPECIMENS EXAMINED: QUEBEC: Longueuil, shores of St. Lawrence River, *Brother Victorin* 1056 (Hb. Gray). ONTARIO: Ottawa, McKay Lake, Aug. 3, 1911, *John Macoun* (Can. Geol. Surv. no. 87545 in Hb. Mo., no. 719897). MAINE: Prouts Neck, Sept., 1898, *Miss M. E. Blatchford* (Hb. Gray). NEW HAMPSHIRE: Newcastle, Little Harbor, Sept. 19, 1901, *Emile F. Williams* (Hb. Gray). MASSACHUSETTS: Boston, Savin Hill, Aug. 28, 1853, *William Boott* (Hb. Gray); Cape Cod, Hyannis Port, *J. M. Greenman* 361 (Hb. Mo. 722293); Pemberton, sandy beach, Aug. 27, 1897, *B. L. Robinson* (Hb. Gray); Nonquitt, Aug. 27, 1888, *E. L. Sturtevant* (Hb. Mo. 85501); Nonquitt, along sea-shore, Sept. 25, 1888, *idem* (Hb. Mo. 85500); Dartmouth, roadside, Sept. 27, 1889, *idem* (Hb. Mo. 85502); Revere, seashore sands, Aug. 22, 1896, *Emile F. Williams* (Hb. Gray); Craigville, sandy roadside, Sept. 5, 1898, *idem* (Hb. Gray); Scituate, seashore, Oct. 29, 1899, *idem* (Hb. Gray); North Scituate, Sept. 6, 1897, *idem* (Hb. Gray). RHODE ISLAND: Block Island, sandy sea-beach, southwest of Chagum Pond, *Fernald, Hunnewell 2nd and Long* 10659 (Hb. Gray); without locality, in 1848, *Flint* (Hb. Gray). NEW YORK: Long Island, Rockaway Beach, Sept., 1892, *Dr. Smith Ely Jelliffe* (Hb. Field 396974). NEW JERSEY: Ocean County, Tom's River, sea-beaches, *Kenneth K. Mackenzie* 1046 (Hb. Mo. 85503). VIRGINIA: Cape Charles City, *Canby and Rose* 845 (Hb. U. S. 297952)—an anomalous form with burs glabrate but glandular upon the body, offering a strong superficial resemblance to *X. palustre* Greene). MISSOURI: Allenton, Sept. 20, 1890, *George W. Letterman* (Hb. Mo. 775049)—a form with burs approaching those of *X. italicum* Mor.). NORTH DAK-

¹ Torrey and Gray (Fl. N. Amer. 2: 295. 1843) described a variety of *X. echinatum* Murr. ("β. prickles of the oval-oblong fructiferous involucre stouter and less crowded; leaves incisely lobed") from the "banks of Spirit Lake, head-waters of the Little Sioux River of the Missouri, *Mr. Nicoll!*" We have seen no authentic material of this variety.

OTA: Leeds, fields, Aug. 16–Sept. 6, 1899, Dr. J. Lunell (Hb. Gray); Leeds, along running water, Aug. 28, 1902, *idem* 82 (Hb. Gray).

This species was badly confused by Wallroth (*Beitr. Bot.* ¹: 239. 1844) with the true *X. orientale* L. Indeed, many other botanists have fallen into similar errors, so that in literature we find *X. echinatum* erroneously equated with a number of entirely distinct species. Thus, for example, Thellung (*Verhandl. Bot. Verein Brandenb.* 50^{II}: 142–144. 1908) actually gives as synonyms, *X. italicum* Mor., *X. pennsylvanicum* Wallr., *X. riparium* Lasch, *X. campestre* Greene¹ and *X. chinense* Mill.

Murray's original description not only was very complete but was accompanied by a good plate.² This plate shows the fruiting involucres to have an ovoid body, with short, rather remote prickles and very wide achenes (ff. 1, 7 and 8). Thellung (*loc. cit.*) attempts to differentiate between Murray's description and plate, retaining the former and excluding the latter. But Murray's description ("..... *Capsula ovalis*, *olivae magnitudinis*, *hirsuta*, *antice hamosa*, *hamis inflexis hispidis*, *vestita aculeis uncinatis*, *divergentibus*, *consertis*, *sursum et apice nudis*, *basi deorsum echinatis per setas rigidas albidas*, *rectiores*; *bilocularis*.....") harmonizes perfectly, in our opinion, with the plate.³ Moreover, Murray himself stated that his plant, raised in 1783, came from fruits sent him by Von Wangenheim, from New York. And it is precisely in the Atlantic coastal region beginning with New York and extending north and south that almost all the plants matching Murray's plate and description are found. Still further, Murray's reference to an olive in describing the fruits ("*Capsula ovalis*, *olivae magnitudinis*") is very significant. The plants cited in our foregoing list as representing true *X. echinatum*, display, more than any other native species of *Xanthium* from Eastern North America, an open, plump, ovoid appearance to the body of the bur in such a way as to suggest an olive.

Numerous authors, like Thellung, have confused *X. echinatum* with the European *X. riparium* Lasch. All the European specimens of *X. riparium* examined by us (about fifteen sheets) have shown burs uniformly smaller, much narrower and with much smaller achenes. It appears to us probable that no European botanist, after examining several American specimens of *X. echinatum*, would hesitate to regard *X. riparium* as distinct.

The plant described by Rafinesque (*loc. cit.*) as *X. maculatum*, came

¹ Thellung had seen, for *X. campestre*, only an incorrectly determined specimen, H. E. Brown 938.

² Cf. Torr. and Gray (*Fl. N. Amer.* 2: 295. 1843), who referred to this plate as "a good figure." But Thellung (*loc. cit.*), who clearly had a very incorrect conception of Murray's species, called the plate very bad ("pessima").

likewise from "the neighbourhood of New York"..... ("on Long Island, near the sea-shore and marshes"). Rafinesque distinguished his plant from *X. echinatum*, stating that *X. echinatum* had "oval fruits, with aggregated, echinate, and hooked thorns." Without doubt, he had in mind not the true *X. echinatum* Murr. but rather the plant later described by Moretti as *X. italicum*. The fruits of his *X. maculatum* he described as "generally solitary..... half an inch long, nearly cylindrical obtuse, with the two beaks scarcely perceptible and bent in, covered with short, thick and rough thorns, *rather soft*, and *not uncinate*." From these characters (especially the ones which we have emphasized with *italics*) as well as from the habitat given ("near the sea-shore and marshes"), we feel certain that by *X. maculatum* Rafinesque meant the plant which was really the true *X. echinatum* Murr.

17. *XANTHIUM ITALICUM* Mor., Brugnatelli Giorn. fis., chim. Dec. II., 5: 326. 1822; Reichenbach Iconographia Botanica 4: 22, tab. 323. 1826.
X. varians Greene, Pittonia 4: 59. 1899.
X. glanduliferum Greene. loc. cit., 61.
X. commune Britton, Manual 912. 1901.
X. Macounii Britton, loc. cit. 913.¹

Caulis ramosus, scaber, lineis atro-purpureis saepe maculatus, 3-10 (-18 fide Moretti) dm. altus. Folia cordata aut late ovata, lobata, dentata, utrinque setulis adpressis scabra, petiolis adjectis 0.8-3 dm. longa, petiolis laminis subaequantibus aut excedentibus. Fructuum (Pl. VII, f. 17; Pl. IX, ff. 25-30) corpus nunc cylindricum, nunc oblongum, nunc ovoideum, sed saepius late oblongum, facie exteriore glanduloso-pubescent et aculeis armatum, 1.3-1.8 cm. longum, 6-8 mm. crassum; rostris plerumque incurvatis et ad apicem hamosis, hispidis, 5-7 mm. longis; aculeis saepius numerosis et tenuibus (rariter vel subremotis vel subcrassis), infra hispidis usque ad medium, supra glabris, ad apicem hamosis, 3-7 mm. longis.

DISTRIBUTION: Quebec, Connecticut and West Virginia to Saskatchewan, Washington, California and Oaxaca; southern Europe, Hawaiian Islands, and probably elsewhere.

¹ We are not able to determine satisfactorily the identity of *X. Cavanillesii* Schouw (Ind. Sem. Hort. Haun.: 14. 1849; Ann. Sc. Nat. sér. III, 12: 357. 1849). Cavanilles' type plate (Cav. Icon. 3: tab. 221. 1794) cited by Schouw, shows the fruits glabrous, except, of course, as to beaks and prickles. If this plate be assumed to be accurate, then the plant figured was undoubtedly *X. chinense* Mill. If, as seems just as likely however, Cavanilles' plate was rather generalized and lacking in detail, as are many of his other plates, then his *plant specimen* probably possessed hispid-aculeate fruit and belonged to *X. italicum*. Cavanilles' description of the fruit (*loc. cit.*, p. 11) is devoid of details as to pubescence: "Fructus ovato-oblongus, pollicaris, estque drupa sicca, undique aculeis uncinatis tecta, apice bifida, cuius nux bilocularis." Schouw's own description of the fruit ("Involucro fructigero ovali, inter aculeos et ad basin rostrorum hispidissimo; aculeis tenuiter subulatis, strictis, inferioribus retrorsum porrectis; rostris tenuibus, strictis, apice uncinatis"), based, however, upon a specimen from Buenos Ayres, by Didrichsen, might well pass for that of *X. italicum*.

SPECIMENS EXAMINED (partial list): QUEBEC: Leamy's Lake, Sept. 11, 1891, *J. Macoun* (Hb. N. Y.). NEW HAMPSHIRE: Charlestown, dry sandy open roadsides, Sept. 16, 1899, *B. L. Robinson* (Hb. Gray). VERMONT: Springfield, open dry sandy roadside, Sept. 16, 1899, *B. L. Robinson* (Hb. Gray). NEW YORK: Westport, shores of Lake Champlain, Sept. 15, 1900, *Dr. and Mrs. N. L. Britton* (Hb. N. Y.; type of *X. commune* Britton); Sandy Hill, along Champlain Canal, *Stewart H. Burnham* 27 (Hb. Gray); Ogdensburg, *Orra Parker Phelps* 1212, 1213 and 1214 (Hb. Gray); Hogansburg, banks of St. Regis River, *eadem* 1216 (Hb. Gray). CONNECTICUT: Plainfield, waste ground, Sept. 6, 1908, *Bissell and Weatherby* (Hb. Gray); Bridgeport, dry roadsides, *E. H. Eames* 1 (Hb. Gray). PENNSYLVANIA: Lancaster, Oct. 7, 1901, *A. A. Heller* (Hb. Field 430065; Hb. Gray;—a form with burs suggesting *X. pennsylvanicum*). Lancaster, Dillerville Swamp, Sept. 24, 1889, *John K. Small* (Hb. Field 168555). MARYLAND: shore of Chesapeake Bay, south of Havre de Grace, *George H. Shull* 391 (Hb. Gray; Hb. Mo. 85504). DISTRICT OF COLUMBIA: shore of Potomac River, Sept. 3, 1876, *Lester F. Ward* (Hb. U. S. 130953). VIRGINIA: along Potomac River, opposite Washington, D. C., Oct. 2, 1904, *E. S. Steele* (Hb. U. S. 504661). WEST VIRGINIA: Hendricks, dry places along Blackwater River, *J. M. Greenman* 537 (Hb. Field 345708; Hb. Gray; form matching type of *X. commune* Britt. very closely). INDIANA: Bluffton, Sept. 9, 1897, *Charles C. Deam* (Hb. Field 123387); vicin. Bluffton, *idem* 548, (Hb. Mo. 85437). Kentucky: locality not stated, *Dr. C. W. Short*, in 1842 (Hb. Gray). ILLINOIS: East St. Louis, Stockyards, Sept. 10, 1886, *H. Eggert* (Hb. Mo. 759571); sandy shore of Lake Michigan, *Frank C. Gates* 50 (Hb. Field 458182); Champaign County, Urbana Township, roadside, *idem* 2112 (Hb. Field 246297; an atypic form with prickles more remote); Winthrop Harbor, *idem* 3228 (Hb. Field 345082 and 459041); Urbana, Sept. 19, 1901, *A. Gilkerson* (Hb. Gray; atypic form with subremote prickles, approaching *X. pennsylvanicum* Wallr.); Metropolis, banks of Ohio River, Aug. 14, 1902, *H. A. Gleason* (Hb. Gray); Champaign, field, *A. S. Pease* 13009 (Hb. Gray); Chicago, along sidewalk, *Earl E. Sherff* 3079 (Hb. Field 480735 and 480736); Chicago, along sidewalk, *idem* 3081 (Hb. Field 480739). IOWA: Ames, *M. Clapper* 10 (Hb. Gray; Hb. Mo. 85441). MISSOURI: Courtney, in bottoms, *B. F. Bush* 1813 (Hb. Mo. 85601); Courtney, in bottoms, *idem* 1910 (Hb. Mo. 85458); Sheffield, *idem* 2216 (Hb. Mo. 85459); Webb City, in cultivated fields, *E. J. Palmer* 1039 (Hb. Mo. 756627); Webb City, waste places, *idem* 1303 (Hb. Mo. 85509 and 756631); Noel, Butler Creek, gravel bars, *idem* 4219 (Hb. Mo. 716540). SOUTH DAKOTA: Watertown, *John J. Thornber*, Aug., 1892, (Hb. Gray). NEBRASKA:

Arcadia, *Rev. J. M. Bates* 5400 (Hb. Gray). TEXAS: Dallas, common on prairie, *B. F. Bush* 1154 (Hb. Mo. 85477); San Antonio, *Mr. and Mrs. J. Clemens* 953 (Hb. Mo. 808717); Graham, J. Reverchon 3279 (Hb. Mo. 85473). SASKATCHEWAN: "South Saskatchewan," *J. Macoun* 41 (Hb. Gray; a small-fruited form). MONTANA: Great Falls, Sept. 16, 1885, *F. W. Anderson* (Hb. Chi. 360828). COLORADO: Denver, common in damp alkaline soil, *Alice Eastwood* 154 (Hb. Gray; Hb. Calif. 148085); vicin. La Junta, *Rose and Fitch* 17507 (Hb. U. S. 760583). NEW MEXICO: Nara Visa, Oct. 7, 1910, *Geo. L. Fisher* (Hb. Mo. 818395); Mesilla Valley, Oct. 13, 1906, *Paul C. Standley* (Hb. Mo. 85488); Mesilla Valley (Donna Ana County), College farm, Oct. 15, 1901, *E. O. Wooton* (Hb. Mo. 85487); Mesilla Valley, *Wooton and Standley* 3129 (Hb. Field 223808). ARIZONA: Chiricahua Mountains, fields and sediments, *J. C. Blumer* 1487 (Hb. Field 242347; Hb. Gray; Hb. Mo. 85495; Hb. N. Y.); Fort Apache, *Rev. Paul S. Mayerhoff* 88 (Hb. Field 113427). WASHINGTON: Spokane, *Frank O. Kreager* 537 (Hb. Gray); Spokane, along creek, Sept. 1, 1899, *C. V. Piper* (Hb. Gray); West Klickitat County, sandy banks of Columbia River, *W. N. Suksdorf* 1583 (Hb. Field 89751; Hb. Gray; Hb. Mo. 85499). CALIFORNIA: Los Angeles, *Dr. Hasse* 4695 (Hb. N. Y.). SAN LUIS POTOSI: San Luis Potosi, in sandy places about the city, *Dr. J. G. Schaffner* 388 (Hb. Gray). SINALOA: near Mazatlan, *Rose, Standley and Russell* 14133 (Hb. N. Y.; Hb. U. S. 636993). GUANAJUATO: Guanajuato, in 1891, *Prof. A. Dugès* (Hb. Gray). MORELOS: near Cuernavaca, *C. G. Pringle* 7330 (Hb. Gray). OAXACA: Valle de Etla, *Rev. Lucius C. Smith* 783 (Hb. Gray). CUBA: Güines, *H. A. Van Hermann* 166 (Hb. Field 170583).

Moretti's original description of *X. italicum* is very full. According to his own account, for a long time he had considered his species to be *X. echinatum* Murr. and had sent specimens so labeled to various eminent botanists such as De Candolle, Bertoloni etc. Finally he was forced to the conclusion that the species was distinct from *X. echinatum* Murr. and so he described it as new. He stated numerous characters in a minutely detailed way. We quote his description of the fruit: "Nux ovato-oblonga, undique aculeata, aculeis rigidis, apice simpliciter uncinatis, singulis undique echinatis. Rostra bina, patula, uncinata, quorum uncini convergentes. Styli basi laeviter complanati, hinc bifidi, e latere interiori uniuscuiusque rostri versus extremitatem prodeuntes."

Moretti's plants were collected in several localities along the Po River from Turin to Pavia. In the Bernhardi Herbarium (Hb. Mo. 85516) there exists a somewhat fragmentary and immature specimen with the inscription "Xanthium echinatum.....frequens Tau-

rini." This is clearly one of Moretti's original specimens. In the De Candolle Herbarium at Geneva there exists a fine mature specimen collected by Moretti in the vicinity of Pavia, in 1819. This likewise had been labeled *Xanthium echinatum* by Moretti.¹ It matches well the Turin specimen from the Bernhardi Herbarium and both of these specimens agree perfectly with the plate published (from a specimen sent by Moretti) by Reichenbach (*loc. cit.*) in 1826.²

X. varians Greene, while somewhat atypic in that its fruiting prickles are slightly stouter, is easily seen to be a form of this species. *X. Macounii* Britton is best considered as likewise a form of *X. italicum*. Unfortunately, the single type specimen on which the description of *X. Macounii* was based has immature fruits. These point, however, to a somewhat atypic, rather sparsely aculeate form of *X. italicum*, such as may be found growing occasionally among plants of the typical form. Of *X. glanduliferum* Greene we have seen two specimens of the type collection (Hb. Can.; Hb. Greene 19844). These would seem at first to be closer to *X. echinatum* Murr. But the size and shape of the achene and the character of the foliage all indicate a closer affinity with *X. italicum*. At best, *X. glanduliferum* is probably to be considered as only another of the mutant forms produced occasionally by *X. italicum*.

With *X. italicum* must be placed also *X. commune* Britton, originally described from Westport, New York. The type specimen of *X. commune* has the burs somewhat immature. These match closely those of the type material of *X. glanduliferum* Greene. We have seen several cases (e. g., Greenman 537, Hb. Gray) in which exactly the same form of burs appeared along with other burs that were typical of *X. italicum*. But whether this divergence from the typical form was due to hybridization or to mere variation we are unable to state.³

18. *XANTHIUM ACEROSUM* Greene, Pittonia 4: 63. 1899.

Caulis flexuosus, lineis purpureis longitudinalibus saepe maculatus, supra scaber, infra fere glabrescens, verisimiliter circum 4–9 dm. altus, Folia late subcordato-ovata, obtusa, crenato-dentata, utrinque setulis minutis adpressis scabra, petiolis adjectis 0.7–2 dm. longa, petiolis laminis subaequantibus. Fructuum (Pl. VII, f. 18; Pl. IX, ff. 22–24) corpus cylindricum, moderate glanduloso-pubescent, aculeis subremotis armatum, 1.5–1.9 cm. longum et 6–7 mm. crassum; rostris tenuibus, attenuatis, molliter pubescentibus, subrectis aut irregulariter incurvatis, ad apicem minime hamosis, 7–8 mm. longis; aculeis vix numerosis,

¹ We rely upon a large and excellent photograph of the sheet, furnished us through the great kindness of the late M. Casimir De Candolle.

² We have seen various European specimens collected, since Moretti's time, in Italy, Corsica, Sardinia etc. Some of these were already labeled *X. italicum*.

³ For distinctions between *X. italicum* and *X. pennsylvanicum*, see p. 34.

gracilibus, remisso fere usque ad apicem pilis mollibus longiusculis vestitis, rectis aut subrectis, ad apicem nunc dimidia parte eorum hamosa, nunc vix uno aculeo hamoso, plerumque 6–9 mm. longis.

DISTRIBUTION: New York (where apparently adventive); Wisconsin, North Dakota and Nebraska.

SPECIMENS EXAMINED: NEW YORK: Whitehall, Dresden Trestle, *Stewart H. Burnham* 28 (Hb. Gray). WISCONSIN: Brown County, Preble, Baird's Creek, Sept. 26, 1899, *J. H. Schuette* (Hb. Gray; Hb. U. S. 751759; the latter a rather immature and indistinctive specimen). NORTH DAKOTA: near Fargo, Sept. 4, 1893, *Edward L. Greene* (Hb. Greene 19835;—type); Minot, along Souris River, *Dr. J. Lunell* 80 (Hb. Gray); Burleigh County, Bismarck, Aug. 23, 1913, *idem* (Hb. Greene 23707). NEBRASKA: Red Cloud, *Rev. J. M. Bates* 4747 (Hb. Gray).

It is with some hesitation that this species is here retained. The fruiting burs, when slightly immature, resemble those of *X. italicum*. When fully ripe, they appear to be intermediate between those on certain forms of *X. pennsylvanicum* Wallr. and those on certain forms of *X. speciosum* Kearney. The brown, ripe burs have a body more or less narrowly cylindrical; the prickles are mostly long and very delicate; their hairs are soft and fine. However, as the specimens examined agree very well among themselves, interference with the status of the species seems scarcely wise or desirable at the present time.

19. *XANTHIUM OVIFORME* Wallr., Beitr. Bot. 1¹¹: 240. 1844.

X. silphiifolium Greene, Pittonia 4: 60. 1899.

Caulis simplex, infra levis, supra scabridus, 3–7 dm. altus. Folia membranacea, indivisa, deltoideo-ovata, interdum vix trinervia, inaequaliter sinuato-dentata, utrinque concoloria et setulis minutis adpressis albidis aspera, ad basim vel orbiculata vel truncata vel cordata, petiolis adjectis 0.7–2 dm. longa, petiolis laminis subaequantibus. Fructus (Pl. VII, f. 19; Pl. X, ff. 1–3) non multi, demum maximi, plerumque singulatim dispositi; fructuum corpore oblongo-ovato, glanduloso-hispido aut rarer glabriusculo, aculeis armato, demum circum 2 cm. longo et 1.2 cm. crasso; rostris validis, crassis, hispidis, supra incurvatis, ad apicem valde uncinatis, circum 8 mm. longis; aculeis remotis aut subremotis (aut fere confertis), validis, arcuatis et corniformibus, fere usque ad apicem ferrugineo-hispidis (saltem ad tergum et latera), ad apicem valde hamosis, ad faciem ventraliem inferioribus plerumque canaliculatis, (5–) 7–10 mm. longis.

DISTRIBUTION: Washington and probably Oregon; also adventive, formerly at least, in southwestern Illinois.

SPECIMENS EXAMINED: WASHINGTON: Wawawai, C. V. *Piper* 3575 (Hb. Gray); Kittitas County, Rock Island, along water-courses, *Sandberg and Leiberg* 446 (Hb. Gray); West Klickitat County, Sept. 28, 1883, sandy banks of the Columbia River, W. N. *Suksdorf* (Hb. Field

97447 and 211249; cotypes of *X. silphiifolium* Greene); without locality, in 1879, *idem* (Hb. Gray); West Klickitat County, bottom lands of the Columbia River, *idem* 189 (Hb. Gray). ILLINOIS: East St. Louis, banks of the Mississippi River, Sept., 1847, Dr. George Engelmann (Hb. Mo. 85552; form close to *X. speciosum* Kearney); cultivated by Asa Gray, in botanical garden, Cambridge, Massachusetts, Oct., 1848, from 171 and 171a of Dr. George Engelmann, collected presumably in September, 1847, at East St. Louis, Ill., with the preceding specimen (2 sheets in Hb. Gray; more typical than Engelmann's own specimen).

Greene (*loc. cit.*), in proposing nine species of *Xanthium* as new, among them *X. silphiifolium*, laid no claims to a very profound knowledge of the genus as a whole. Thus, with reference to Wallroth's monographic treatment of *Xanthium*, he says: "At present I know nothing as to what his *X. laevigatum*, *pungens*, *pennsylvanicum*, *xanthocarpum* or *oviforme* are. Presumably, however, they all belong to the Atlantic slope of the continent. Little or nothing was known of this genus as represented west of the Mississippi in the year 1842 [*sic*]. As all the following are from far-western regions, I shall, in naming them as new, incur small risk of becoming a manufacturer of synonyms."

Regarding three of these species, *viz.* *X. pungens*, *X. pennsylvanicum* and "*X. xanthocarpum*," there need be no doubt as to the forms referred to by Wallroth (*cf. pp. 22, 31 and 15*). Regarding *X. laevigatum*, we ourselves are unable as yet to reach positive conclusions. The case of *X. oviforme*, however, lends itself to very definite treatment. Wallroth's description of this species is decisive and clear. In speaking of the fruits he says (*loc. cit.*): "fructibus sessilibus solitariis utrinque aequaliter rotundatis oviformibus (maximis), aculeis confertis validis corniformibus basi pilis articulatis ferrugineis densis vestitis cum rostris intus contractis teretibus figura, vestitu et longitudine subconformibus deliquescendo veluti obliteratis." We have also his footnotes regarding the fruits. The first one says: "5) eiförmige, in Vergleich zur Pflanze (d.h. dem vorliegenden Probestücke) sehr grosse, mit den Stacheln dem Umfang einer kleinen Wallnuss oder Müsskatennuss gleichende Frucht."¹

¹ Two other footnotes in connection with the fruits are given by Wallroth. We reproduce them verbatim herewith: "6) besonders stark ausgebildete, dichtstehende, 2" lange Stacheln, welche bis über die Halte mit dicht- und abstehenden, gegliederten Haaren umstarrt sind, am oberen Theile aufwärts, in der Mitte etwas abwärts und am Grunde rückwärts gerichtet sind und den ganzen Fruchtkörper allenthalben dicht und gleichmässig umstarren;

"7) mit den Stacheln fast gleichförmige, nur doppelt so starcke, nach oben rinnenförmig ausgehöhlte Stacheln, welche wegen gegenseitiger Aehnlichkeit mit den Stacheln gleichsam zu verschwinden oder im Vergleich mit anderen Arten zu fehlen scheinen."—The grooved ventral surfaces exhibited by certain of the large basal prickles on the fruits of this species seem indeed an unique character.

A comparison of Wallroth's Latin description with the others in his monograph shows two outstanding features for his *X. oviforme*. The fruits were *very large* and were covered with strong, *horn-shaped* prickles, these densely clothed at their base with jointed, reddish hairs. Furthermore, Wallroth based his species directly upon Hooker's *Xanthium canadense* from North America ("*X. Canadense* Hook. *in lit. (herb. general berol.)*, nec Herm., Mill. et Linn. *Angeblich* in Nordamerika und vermutlich in Canada.").

Thus, Wallroth had seen a plant in Berlin labeled "*X. canadense*" by Hooker, but which appeared distinct from all other specimens because of its mammoth burs and their horn-shaped prickles. On reference to Hooker's Flora Boreali-Americanana, a work published in 1840 and which Wallroth appears not to have seen, we find the basis of Wallroth's species. Hooker (*loc. cit.* 308), instead of giving an extended range or list of stations as in the case of many other species, gave merely, "Hab. Canada? North-West coast of America. Douglas." So the plant determined by Hooker as *X. canadense* was a plant collected by Douglas along the northwest coast of (North) America.¹ But it was in this same region that the type of *X. silphifolium* Greene was obtained. Greene's type was collected by Suksdorf, on the banks of the Columbia River,² September, 1883. While this type itself (in Hb. U. S.) is at present inaccessible to us, we have seen the two excellent cotypes in the Herbarium of Field Museum and also the two other specimens by Suksdorf in Gray Herbarium. These all agree well with each other in having large, coarse burs, with very strong, elongate, reddish-hispid, horn-shaped (arcuate), hooked prickles and somewhat similar beaks; the lower prickles on each bur tend to be strongly grooved upon the ventral face. The specimen collected by Suksdorf on bottom lands of the Columbia River (no. 189) is particularly instructive. It is accompanied by one mature bur, much larger than the rest, a bur such as most collectors might shrink from trying to press. This bur is really of gigantic proportions, having a size observed by us so far in only two other species (*X. campestre* and *X. speciosum*). The body proper is 2.3 cm. long and about 1 cm. thick. The prickles and beaks measure from 8 mm. to 10 mm. in length, giving the bur a total expanse of 3.9 cm. in length and about 2.8 mm. in width.

Without question, it was this large-fruited form of *Xanthium* that

¹ Had Hooker seen plants of this species from other collections it is clear that he would have cited them, since his citations of range appear in each case to be as complete as his data at that time would permit.

² An examination of Hooker's text shows that a large proportion of the other Douglas plants studied by Hooker had likewise come definitely from the banks of the Columbia River.

was the basis of Wallroth's *X. oviforme* and the identity of the species is thus seen to be settled too clearly to permit of its name being displaced by the more recent name *X. silphiifolium*.¹

20. *XANTHİUM SPECIOSUM* Kearney, Bull. Tor. Bot. Club 24: 574, 1897.

X. bubalocarpon Bush, Rept. Missouri Bot. Gard. 17: 123, 1906.²

Caulis erectus, robustus, ramosus, ad basim demum 2.5 cm. crassus, plus minusve (infra obtuse et supra acute) quadrangulatus, supra lineis purpureis maculatus, papilloso-scabridus praesertim supra, 1-1.5 m. altus. Folia late triangulato-ovata, obtuse et non profunde 3-5-lobata, dentata, crassiuncula, ad basim cordata, utrinque setulis aut papillis minutis adpressis scabra, petiolis adjectis 1-3.5 dm. longa et 0.8-2.2 dm. lata, petiolis laminis subaequantibus. Fructus (Pl. VII, f. 20; Pl. X, ff. 4-6) maximi, ovoidei aut conici; corpore ovato-cylindrico, vix aspectabilis, glanduloso-pubescenti, aculeis armato, demum circum 2-2.3 mm. longo et 7-8 mm. crasso; rostris attenuatis, hispidis, subrectis aut incurvatis, ad apicem hamosis, 6-11 mm. longis; aculeis confertis, subtenuibus, besse inferiore aut dimidio inferiore hispido, versus apicem levibus, ad apicem hamosis, plerumque 7-9 mm. longis; toto fructu (aculeis et rostris adjectis) demum 3-4 cm. longis et 2-2.5 (-3 ex descriptionibus Kearneyi et Bushii) cm. latis.

DISTRIBUTION: Tennessee to South Dakota, Texas and Mexico; adventive in Maine and Vermont.³

SPECIMENS EXAMINED:⁴ MAINE: North Berwick, wool-waste heap, Sept., 1895, John C. Parlin (Hb. Gray). TENNESSEE: Cocke County, between Paint Rock and Del Rio, along French Broad River, Thos. H. Kearney, Jr., 785 (Hb. Greene 19829; Hb. Mo. 85550; Hb. N. Y.; cotypes). MISSOURI: Cass County, roadside, prairie, Aug., 1869, G. C.

¹ Since the above was written, we have been very fortunate in receiving from the Herbaria of the British Museum of Natural History and the Royal Botanical Gardens at Kew, excellent photographs of the Douglas plants. Our conclusions, as presented above, are seen to be confirmed most emphatically. Both specimens match precisely the Suksdorf material of *X. silphiifolium*. The inscription on the British Museum sheet, as copied for us, reads, "X. strumarium Willd. Sandy island and banks of the Columbia Douglas 1825 Xanthium canadense Spreng. Hook Fl. Bor-Am. I. p. 308." That upon the sheet at Kew (a sheet originally in Bentham's private herbarium) reads, "Xanthium canadense Spr. Hook Fl. Bor. Am. I. 308. Am. bor. occ. Douglas 1829 [sic] X. oviforme Wallr. cotype."

² Piper (Contrib. U. S. Nat. Herb. II: 550. 1906) has referred *X. silphiifolium* Greene to this species. But, as will be apparent from the foregoing paragraphs (*Cf. X. oviforme*, p. 44) if *X. silphiifolium*, which is synonymous with *X. oviforme*, shall subsequently be proved conspecific with *X. speciosum*, then, by the same proof, *X. speciosum* will have been shown to be synonymous with *X. oviforme*.

³ Cf. footnote 1, p. 27.

⁴ We have seen two specimens by H. Eggert, one at least from Illinois (presumably at East St. Louis), collected Sept. 13, 1874 (Hb. Gray; Hb. Mo. 85381). These appear to be *X. speciosum*, but the prickles are subremote and rather stout and suggest *X. oviforme* Wallr. very strongly.

Broadhead (Hb. Mo. 85553). ARKANSAS: Fulton, *B. F. Bush* 2408 (Hb. Mo. 85375). SOUTH DAKOTA: Deadwood, waste ground, alt. 1430 m., *John Murdoch, Jr.*, 4334 (Hb. Gray). KANSAS: Kiowa County, low ground, *A. S. Hitchcock* 726 (Hb. Gray; Hb. Mo. 85525). OKLAHOMA: Hugo, moist limestone soil, *E. J. Palmer* 9015 (Hb. Mo. 794481). TEXAS: Dallas, prairie, *B. F. Bush* 1185 (Hb. Gray; Hb. Mo. 85380; type specimens of *X. bubalocarpon* Bush); Pease River, near Vernon, salt bottoms, Sept. 18, 1903, *H. Eggert* (Hb. Mo. 85558 and 85559); Dallas, Oct. 10, year not stated, *J. Reverchon* (Hb. Mo. 85557); Coombs Branch, Aug. 24, 1901, *idem* (Hb. Mo. 85556 and 85562); Coombs Branch, Oct. 9, year not stated, *idem*, (Hb. Mo. 85479); Dallas, prairie, Aug. 30, 1901, *idem* (Hb. Gray; Hb. Mo. 85378); Dallas, prairie, *idem* 2580 A (Hb. Mo. 85379); Luck's Mill, Aug. 25, year not stated, *idem* (Hb. Mo. 85560 and 85561); Oak Cliff, wastes, Aug. 30, 1901, *idem* (Hb. Mo. 85376 and 85377).¹

While appearing in rare cases to intergrade or perhaps hybridize with *X. oviforme* Wallr., *X. speciosum* seems, nevertheless, on the whole to be worthy of retention as a distinct species. It is apparently best distinguished from that species by the closer, more slender and less arcuate prickles, which do not suggest horns, and by a tendency of the entire involucre, when mature, toward a yellowish or yellowish-brown color rather than toward the dark-reddish color shown in *X. oviforme*.

The several sheets of type material (Kearney 785) that we have examined are of a slightly immature stage and the burs are not fully ripened. But Kearney (*loc. cit.*) described the burs as "2.5–4 cm. long, 2.5–3 cm. wide (including the prickles)" and, as some of the slightly immature burs are observed by us on the type material to have become 3.5 cm. long and 2.5 cm. wide (including the prickles), it is certain that Kearney's measurements correctly represent the mature fruits.

In describing his *X. bubalocarpon*, Bush (*loc. cit.*) stated: "This very distinct species is more nearly related to *X. speciosum* Kearney, but is easily distinguished from that species by the much larger burs which are of an entirely different shape." However, on reading his description, we find given the measurements "2.5–4 cm. long, including the prickles." It is seen that these measurements are practically identical with those given by Kearney for *X. speciosum*. And, indeed, when we compare the excellent type material of *X. bubalocarpon* (Bush 1185) with that of *X. speciosum*, we can detect no specific difference.

¹ We have seen no typical material of *X. speciosum* from Mexico. Certain somewhat anomalous forms from there appear, however, to be best regarded as belonging to this species (e.g., *J. N. Rose* 2433, near San Juan Capistrano, Zacatecas, Hb. U. S. 301344; *Rose, Painter and Rose* 9952, near Tehuacan, Puebla, Hb. U. S. 453446).

The two are well connected, furthermore, by the various other specimens of differing stages of maturity examined by us and cited above.

21. *XANTHIUM CAMPESTRE* Greene, Pittonia 4: 61. 1899.

Caulis saepe lineis purpureis brevibus maculatus, supra scabridus, 5–8 dm. altus. Folia subcrassa, subdeltaoidea, dentata aut serrata, non perspicue lobata, ad basim truncata aut cordata, supra scabra, infra scabro-pubescentia, petiolis adjectis 6–17 cm. longa, petiolis laminis subaequantibus. Fructus (Pl. VII, f. 21; Pl. X, ff. 7–8) maximi, maximam partem singulatim dispositi, ovoideo-conici; corpore non saepe aspectabili sed aculeis plerumque numerosis et densissimis armato, demum circ. 2.3–2.6 cm. longo et 1–1.3 cm. crasso; rostris late divergentibus, infra crassis et pubescentibus, supra glabratris et tenuiter hamosis, 6–7 mm. longis; aculeis teretibus, arcuatis, infra (demum ferrugineo-) hispidissimis, supra glabris et ad apicem hamosis, circum 5 mm. longis; toto fructu (aculeis et rostris adjectis) demum 2.8–3.5 cm. longo et 2–2.5 cm. lato.

DISTRIBUTION: California.

SPECIMENS EXAMINED: CALIFORNIA: Chico, June 27, 1890, *Edward L. Greene* (Hb. Greene 19837; type); Chico-Hamilton Road, 9.5 km. northwest of Chico, A. A. Heller 11629 (Hb. Calif. 179073; Hb. Field 426983; Hb. Gray; Hb. Greene 51204; Hb. Mo. 748145; Hb. N. Y., a more mature specimen, with the burs just turning reddish in color.)

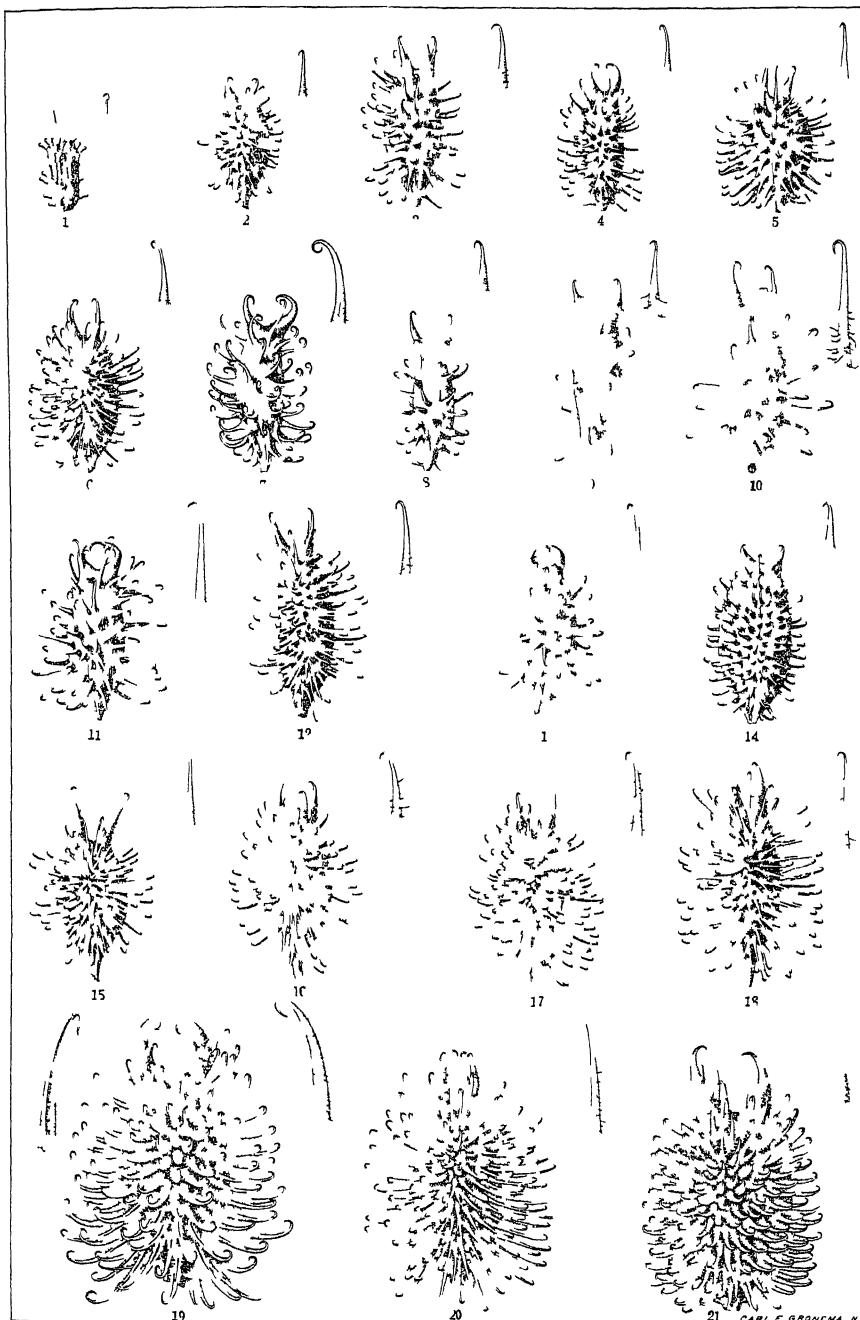
This species is distinguished from most others by the great size of its burs, these coming to have, when well-developed, an expanse (including the beaks and prickles) of about 3.5 cm. in length and 2.5 cm. in width. In Greene's type specimen, the prickles are remote enough to permit a view of the body of the bur. The several somewhat immature specimens by Heller have the prickles more densely grouped together, leaving the body mostly concealed. The burs have a decidedly yellowish-green color until nearly mature, when they turn to a reddish color, rather closely resembling those of *X. oviforme* Wallr.

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PLATE VII.

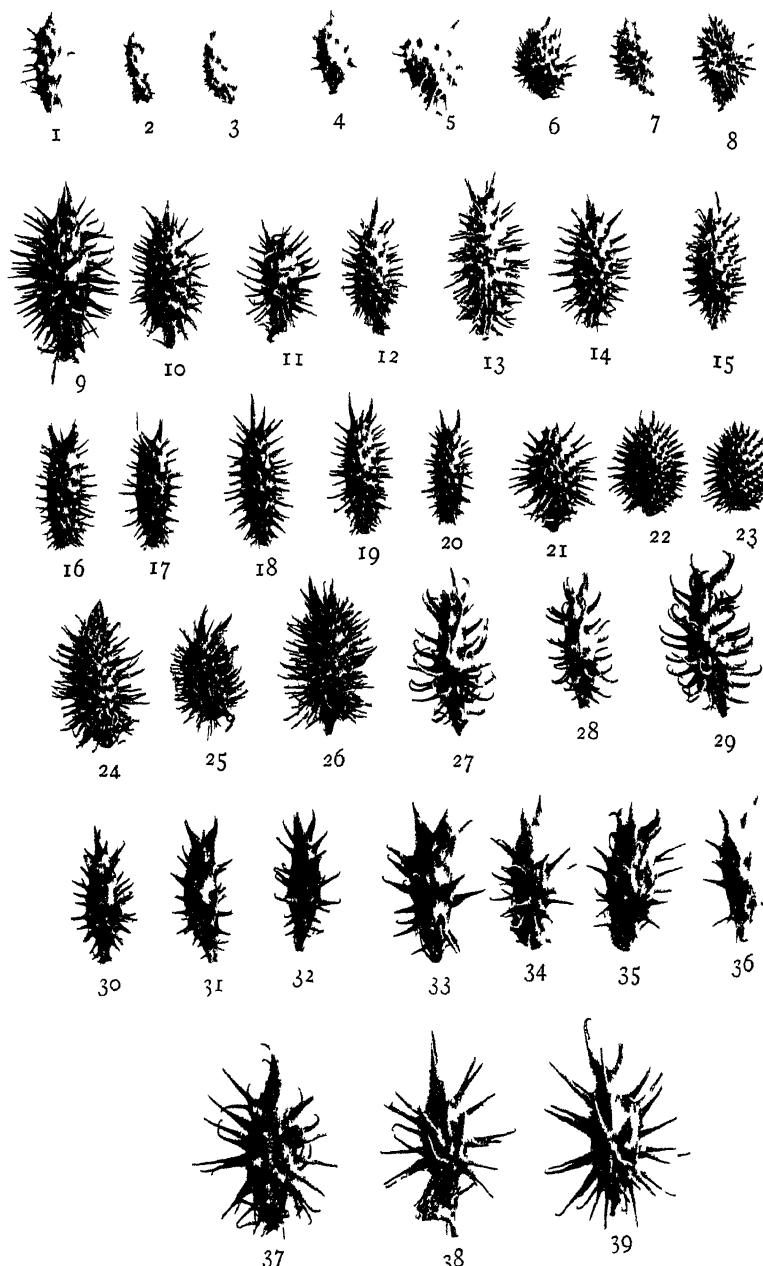
- F. 1. *X. spinosum* L. Eggert (Hb. Mo. 720835).
F. 2. *X. strumarium* L. Brandegee (Hb. Calif. 131246).
F. 3. *X. chinense* Mill. Greenman 47 (Hb. Field 189512; topotype; atypic in having prickles slightly pubescent at base.)
F. 4. *X. cylindricum* Millsp. and Sherff. Small and Huger (Hb. Field 401312; type).
F. 5. *X. globosum* Shull. Shull (Hb. Field 477328; lineal descendant of type material).
F. 6. *X. arcuatum* Millsp. and Sherff. Lucy (Hb. Field 4953; type).
F. 7. *X. curvescens* Millsp. and Sherff. Eggleston 1420 (Hb. Gray; type).
F. 8. *X. leptocarpum* Millsp. and Sherff. Jones (Hb. Field 430860; type).
F. 9. *X. Wootoni* Cockll. ex De Vries. T. D. A. Cockerell, Las Vegas, New Mexico,
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F. 10. *X. cenchroides* Millsp. and Sherff. Reverchon 2332 (Hb. Mo. 85563; type).
F. 11. *X. inflexum* Mack. and Bush. Bush 1916 (Hb. Mo. 85520; type material).
F. 12. *X. pennsylvanicum* Wallr. Lansing 3532 (Hb. Field 346590).
F. 13. *X. calvum* Millsp. and Sherff. Baker 1760 (Hb. Calif. 131236; type).
F. 14. *X. palustre* Greene. Walker 973 (Hb. Calif. 128022).
F. 15. *X. australe* Millsp. and Sherff. Palmer 275 (Hb. U. S. 463216; type).
F. 16. *X. echinatum* Murr. Miss M. E. Blatchford, Prouts Neck, Me., Sept., 1898
(Hb. Gray).
F. 17. *X. italicum* Mor. B. L. Robinson, Springfield, Vt., Sept. 16, 1899 (Hb. Gray).
F. 18. *X. acerosum* Greene. Lunell 80 (Hb. Gray).
F. 19. *X. oviforme* Wallr. Suksdorf 189 (Hb. Gray).
F. 20. *X. speciosum* Kearn. Bush 1185 (Hb. Mo. 85380; type material of *X. bubalocarpon* Bush).
F. 21. *X. campestre* Greene. Heller 11629 (Hb. Gray; topotype).



FRUITS OF XANTHIUM (Natural size)

PLATE VIII.

- X. spinosum L.
F. 1. C. R. Orcutt, Port Harford, Calif., Nov. 23, 1886 (Hb. Mo. 85586).
F. 2. Heller 12655 (Hb. Mo. 802945).
F. 3. Griffiths 7344 (Hb. Mo. 85583).
- X. strumarium L.
F. 4. Hb. Schlagintweit, drained lake basin of Kashmir, vicin. Srinagger, prov. Kashmir, India, Oct. 2-20, 1856 (Hb. Gray).
F. 5. T. Thomson, Plan. Ganget. Sup., India Orient. (Hb. Gray).
F. 6. Fernald, Crescent Beach, Revere, Mass., Oct. 20, 1912 (Hb. Gray).
F. 7. W. Schimper 1343, in agris Sorghi pr. Sabra Abyssinia (Hb. Gray; cotype of *X. abyssinicum* Wallr.).
F. 8. Kotschy i iter nubicum 319, ad ripas Nili albi prope Chartum in provincia Sennar (Hb. Gray; cotype of *X. antiquorum* Wallr.).
- X. chinense Mill.
F. 9. Rose, Fitch and Russell 4351 (Hb. U. S. 760483, topotype of *X. occidentale* Bertol.).
F. 10. Greenman 47 (Hb. Field 189512, topotype).
F. 11. Brown and Britton 374 (Hb. Field 203890).
F. 12. Bush 1348 (Hb. Mo. 85428).
F. 13. Phelps 989 (Hb. Gray).
Ff. 14 and 15. Anonymous (Hb. Fla. Agricult. Coll. no. 1279 in Hb. Field, no. 234909).
- X. cylindricum Millsp. and Sheriff.
Ff. 16, 17 and 18. Small and Huger (Hb. Field 401312, type).
Ff. 19 and 20. (Hb. N. Y., cotype).
- X. globosum Shull.
F. 21. Shull (Hb. Field 477328, lineal descendant of type material).
Ff. 22 and 23. Shull (Hb. Field 477326, topotype identical with type).
- X. arcuatum Millsp. and Sheriff.
Ff. 24, 25 and 26. Lucy (Hb. Field 4953, type).
- X. curvescens Millsp. and Sheriff.
Ff. 27, 28 and 29. Eggleston 1420 (Hb. Gray, type).
- X. leptocarpum Millsp. and Sheriff.
Ff. 30, 31 and 32. Jones (Hb. Field 430860, type).
- X. Wootoni Cockll. ex De Vries.
F. 33. Deane, South Boston, Mass., Oct. 4, 1909 (Hb. Williams in Hb. Gray).
F. 34. Horner B 272 (Hb. Gray).
F. 35. Piper (Hb. N. Y., cotype of *X. oligacanthum* Piper).
F. 36. Cockerell (Hb. Gray, author's material).
- X. cenchroides Millsp. and Sheriff.
Ff. 37 and 38. Reverchon 2332 (Hb. Mo. 85564, cotype).
F. 39. Reverchon 2332 (Hb. Mo. 85563, type).



FRUITS OF XANTHIUM (Natural size)

PLATE IX.

X. inflexum Mack. and Bush.

- F. 1. Bush 1916 (Hb. Gray, type material).
- F. 2. Engelmann (Hb. Mo. 85551).
- F. 3. Bush 1806 (Hb. Mo. 85522).
- F. 4. Bush 1806 (Hb. Gray).

X. pennsylvanicum Wallr.

- F. 5. Greene (Hb. Greene 19822; type of *X. californicum* Greene).
- F. 6. Sanford (Hb. Greene 19819, type of *X. acutum* Greene).
- F. 7. Reverchon 2589 (Hb. Mo. 85546).
- F. 8. Suksdorf 1584 (Hb. Mo. 85374; cotype of *X. affine* Greene).
- F. 9. Lansing 3532 (Hb. Field 346590).
- F. 10. Heller 7550 (Hb. N. Y.).

X. calvum Millsp. and Sherff.

- Ff. 11 and 12. Baker 1760 (Hb. Calif. 131236, type).

X. palustre Greene.

- F. 13. Greene (Hb. Greene 19834, type material).
- F. 14. Greene (Hb. Greene 19833, type material).
- F. 15. Walker 973 (Hb. Calif. 128022).

X. australe Millsp. and Sherff.

- F. 16. Palmer 275 (Hb. U. S. 463216, type).
- F. 17. Dr. Mertens, Valparaiso, Chile (ex Hb. Acad. Petrop., in Hb. Gray).
- F. 18. Morong 807 (Hb. N. Y.).

X. echinatum Murr.

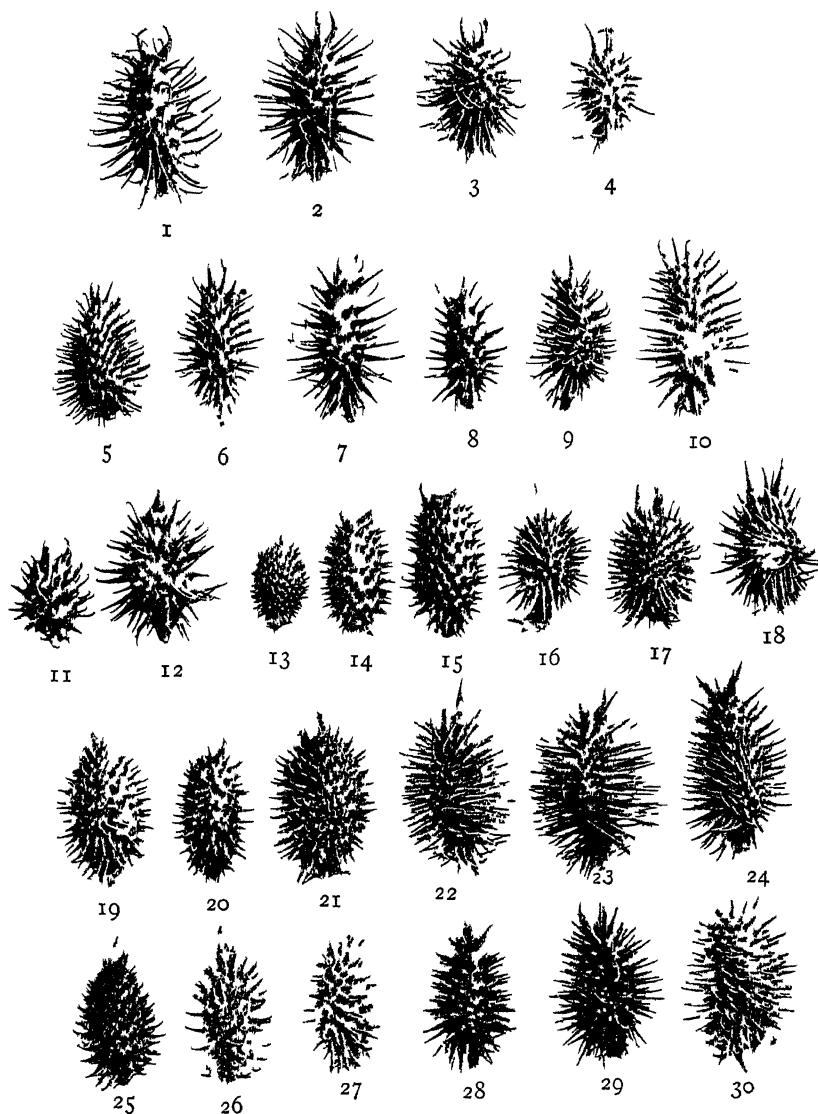
- F. 19. Sturtevant (Hb. Mo. 85500).
- F. 20. Victorin 1056 (Hb. Gray).
- F. 21. Miss M. E. Blatchford, Prouts Neck, Me., Sept., 1898 (Hb. Gray).

X. acerosum Greene.

- F. 22. J. H. Schuette, Baird's Creek, Preble, Brown County, Wis., Sept. 26, 1899 (Hb. Gray).
- F. 23. Burnham 28 (Hb. Gray).
- F. 24. Lunell 80 (Hb. Gray).

X. italicum Mor.

- F. 25. Suksdorf 1583 (Hb. Field 89751, cotype of *X. varians* Greene).
- F. 26. Macoun 11415 (Hb. Can. 11415, type of *X. Macounii* Britton).
- F. 27. Macoun 10910 (Hb. Can. 10910, type material of *X. glanduliferum* Greene).
- F. 28. Sherff 3081 (Hb. Field 480739, matching fruits on Moretti's specimen in Hb. De Candolle).
- F. 29. Bruyas, gravelly fields along banks of the Arc River, Aix Bouches-du-Rhone, France, Sept. 27, 1884 (Hb. Field 331608).
- F. 30. Rose and Fitch 17507 (Hb. U. S. 760583).



FRUITS OF XANTHIUM (Natural Size)

PLATE X.

X. oviforme Wallr.

F. 1. Suksdorf (Hb. Field 211249, cotype of *X. silphiifolium* Greene).

F. 2 and 3. Suksdorf 189 (Hb. Gray, topotype of *X. silphiifolium* Greene).

X. speciosum Kearn.

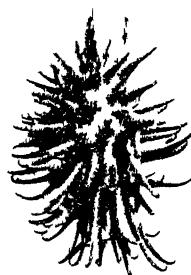
F. 4 and 6. Bush 1185 (Hb. Mo. 85380, type material of *X. bubalocarpon* Bush).

F. 5. Kearney 785 (Hb. N. Y.; cotype).

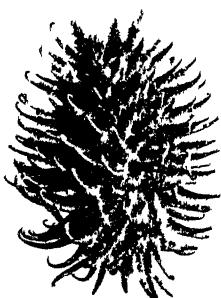
X. campestre Greene.

F. 7. Greene (Hb. Greene 19837, type; an atypic bur on lower part of plant; burs higher up on type are more as in f. 8).

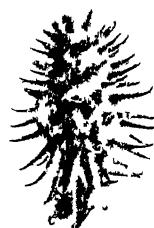
F. 8. Heller 11629 (Hb. Gray, topotype).



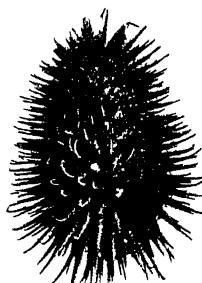
I



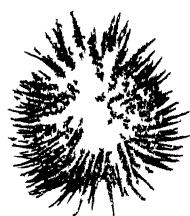
2



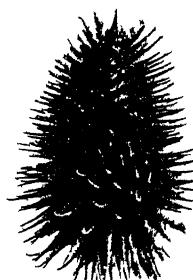
3



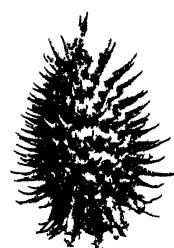
4



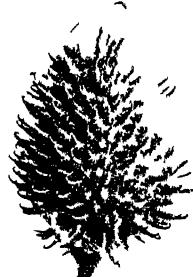
5



6



7



8

FRUITS OF XANTHIUM Natural size

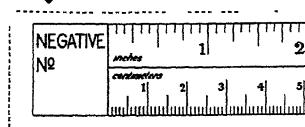


REPROD. OF ANH. A

1 2 3 4 5 6 7

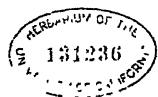
NEGATIVE	1	2
No.	1	2
inches		
centimeters	1	2
mm	25	50
mm	1	2
mm	3	4
mm	5	6
mm	7	8
mm	9	10
mm	11	12
mm	13	14
mm	15	16
mm	17	18
mm	19	20
mm	21	22
mm	23	24
mm	25	26
mm	27	28
mm	29	30
mm	31	32
mm	33	34
mm	35	36
mm	37	38
mm	39	40
mm	41	42
mm	43	44
mm	45	46
mm	47	48
mm	49	50
mm	51	52
mm	53	54
mm	55	56
mm	57	58
mm	59	60
mm	61	62
mm	63	64
mm	65	66
mm	67	68
mm	69	70
mm	71	72
mm	73	74
mm	75	76
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mm	79	80
mm	81	82
mm	83	84
mm	85	86
mm	87	88
mm	89	90
mm	91	92
mm	93	94
mm	95	96
mm	97	98
mm	99	100

XANTHIUM CURVESCENS



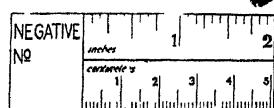
REVISION OF XANTHUM.

Xanthium californicum sp. nov.
Type Millspau, h. Shaff



SUPPLEMENTARY
PLANTS OF THE PACIFIC COAST
D. C. DAVIS & BOYER

No. 1760
Xanthium californicum sp. nov.
coll. 8.2.70 south of Stanford, Calif.



REVISION OF XANTHUM

Xanthium australe Millsp & Steyer
Type

Millsp & Steyer

XANTHUM AUSTRALE

FIELD MUSEUM OF NATURAL HISTORY

PUBLICATION 225

BOTANICAL SERIES

VOL. IV, No. 3

THE TAXONOMY OF POISON IVY
WITH A NOTE ON THE ORIGIN OF
THE GENERIC NAME

BY

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EDITOR



CHICAGO, U. S. A.
March 14, 1925

THE TAXONOMY OF POISON IVY

WITH A NOTE ON THE ORIGIN OF THE GENERIC NAME

JAMES B. McNAIR

During a chemical investigation of *Rhus*,¹ the writer became interested in the geographical distribution of "poison ivy" (*Rhus Toxicodendron* L.). The common name applies to several species. On closer scrutiny it soon became evident that many of the new species which have been proposed during recent years were synonymous. Consequently an investigation of the taxonomy of the group seemed desirable.

For this study, material was borrowed from the United States National Herbarium, Washington, D.C. (U.S.); the Academy of Natural Sciences, Philadelphia, Pennsylvania (A.N.S.); and the Rocky Mountain Herbarium, Laramie, Wyoming (R.Mt.). Single specimens were borrowed from the Gray Herbarium, Cambridge, Massachusetts (G.H.) and the Herbarium of the Geological Survey of Canada, Ottawa, Canada (Can.). In the citation of specimens, the abbreviations indicated have been used. Specimens in the Herbarium of the Field Museum are noted by the letter F. The writer wishes to express his appreciation for these loans to W. R. Maxon, F. W. Pennell, Aven Nelson, B. L. Robinson, and M. O. Malte. For assistance with the taxonomy and form of the paper the writer is indebted to Mr. J. Francis Macbride, and to Dr. B. E. Dahlgren, of the Field Museum for criticism of the manuscript and suggestions.

ORIGIN OF THE GENERIC NAME

The common English name, "sumach," is similar to the ancient Arabian "sommaq" and the Byzantian σούμακι,² from which it is probably derived. The botanical name for the genus *Rhus* has a more obscure origin. Miller³ states that the genus name *Rhus*, as used by him, is

¹McNair, James B. *Rhus Dermatitis, Its Pathology and Chemotherapy*. Chicago: University of Chicago Press, 1923.

²Hehn, V. *Kulturplanzen u. Haustiere*, ed. 7. Berlin, 1902.

³Miller, Phillip. *The Gardener's and Botanist's Dictionary*. Ed. ix, Vol. 2, "Rhus," 1804.

that of Pliny. Pliny (A.D. 23–79)¹ says that *rhus* is from the Greek name for these trees, *ροῦς*, and that *ροῦς* has no Latin equivalent. The word *ροῦς* is also used by Dioscorides as a name for these plants and together with the ablative *ρορε* or a corrupted form *ρορις* is employed by various other ancient writers on medicine and animal husbandry.^{2–6}

Some 350 years before Pliny, Theophrastus⁷ used the word *ροῦς* in describing sumachs, and in the sixth century B.C. the word is found to have been used similarly by Solon, the Athenian.⁸

When one investigates the etymology of the word *ροῦς*, a great difference of opinion is encountered as to its possible derivation and meaning. Miller⁹ gives as a possible derivation its contraction from *ρόος*, and that from the Greek verb *ρέω* “to flow,” because certain products of the plant were formerly used to check hemorrhages. Boehmer¹⁰ suggests that the name is derived from the red color of the berries, from the word *ρόος*, Latin *rufus* (red), or from *ἐρυθρὸν*, Latin *rubrum* (red). Paxton¹¹ gives as a possible origin the Celtic word “rhudd,” or red, from the prevailing color of the autumn foliage, but the Celtic tribes were probably too far north to have influenced the derivation of the word *rhus*, as the plants mentioned by Theophrastus and Pliny were native to Asia Minor. Since Pliny says the word *rhus* or *ros* has no Latin equivalent, it is thus likely that its origin is to be found in Greek or in some kindred language of Asia Minor.

ORIGIN OF THE GENERIC NAME AS APPLIED TO AMERICAN POISON IVY

The first specimen of the poison ivy group to be classified by botanists was that of Cornutus, which, in 1635,¹² he called *Edera trifolia canadensis*.

¹ Pliny, Caius Secundus. Natural History. English transl. by John Bostock and H. T. Riley. 3: 179. London, 1855.

² Dioscorides. Pedanios Anazarbeus Opera quae extant omnia, p. 21. Frankfurt, 1498.

³ Taurus, Palladius Rutillius. Martius Mensis or Liber xi.15.1 A.D. 350.

⁴ Columella, Junius Moderatus. A.D. 50.

⁵ Largus, Scribonius. Compositio Medicamentorum, p. 152. A.D. 50.

⁶ Celsus, Aulus Cornelius. Medicinae libri octo, 6.11. A.D. 50.

⁷ Theophrastus. Enquiry into plants. English transl. by Sir Arthur Hort. 1: 269. New York, 1916.

⁸ Photius, Patriarch of Constantinople. Φωτίου τοῦ πατριάρχου Λέξεων συναγωγὴ. Ed. by P. P. Dobree. 2: 491, l. 21. London, 1822.

⁹ Loc. cit.

¹⁰ Boehmer, Georg Rudolf. Lexicon rei herbariae tripartitum. Lipsiae, 1802.

¹¹ Paxton, J. Botanical Dictionary. Rev. ed., p. 482, 1868.

¹² Cornutus, Jacob. Plantarum Canadensis, etc., pp. 96–98. Paris, 1635.

In 1719¹ Tournefort renamed this plant *Toxicodendron triphyllum* and at the same time established two genera: *Rhus*, with unequally pinnate leaves and a villose fruit with a globular nucleus, and *Toxicodendron*, with ternate leaves, a striated fruit, and compressed nucleus.

Linnaeus, in 1753,² reduced *Toxicodendron* to *Rhus*.

Miller, in 1804,³ again divided the genus into *Rhus* and *Toxicodendron*, describing the former genus as having only hermaphrodite flowers and the latter dioecious.

Several modern botanists, including Kuntze,⁴ Greene,⁵ and Britton and Brown,⁶ have accepted Miller's segregation but not the characters upon which it was based. For their division Britton and Brown have the following key:

Fruit densely pubescent, its stems smooth.
Flowers in dense terminal panicles, appearing after the leaves *Rhus*
Fruit glabrous, or sparingly pubescent, its stones striate *Toxicodendron*

From facts pointed out later in this paper, it is evident that the division of the genus on any of the foregoing grounds of leaf, flower, fruit, and seed structure will no longer hold. The genus cannot be divided, giving to *Toxicodendron* the 3-foliate *Rhus*, as *R. Vernix* L., a poisonous species, is 7-13 foliate; nor would *Toxicodendron* include all those with dioecious flowers; furthermore one of the *Toxicodendron* species, *R. quercifolia* (Michx.) Steud., has densely pubescent fruit and a smooth stone.

KEY TO SPECIES

Seeds smooth; fruit usually distinctly papillose or pubescent; ♂ petals 2-3 x 1; leaflets with 3-7 regular lobes..... 1. *R. quercifolia*
Seeds roughened; fruit usually smooth; ♂ petals 3-4 x 1-2; leaflets various, if lobed, irregularly.
Leaflets obtuse or rounded at apex, entire, crenate or bluntly lobed; Pacific Coast species..... 2. *R. diversiloba*
Leaflets acute, sometimes abruptly so, entire or serrate.
Seeds regular in outline, at least not definitely pinched in at the sides; distribution general, except California..... 3. *R. Toxicodendron*
Seeds irregular in outline, rounded-cuneiform, definitely pinched in at the sides; Lower California..... 4. *R. divaricata*

¹ Tournefort, Joseph Pitton. *Institutiones Rei Herbariae*. 1:610-11. Paris, 1700.

² Linnaeus, Carolus. *Species Plantarum*. 1: 266. 1753.

³ Miller, Phillip. *Loc. cit.*

⁴ Kuntze, Otto. *Revisio Generum Plantarum*. Part I, pp. 153-54. Leipzig, 1891.

⁵ Greene, Edward Lee. *Leaflets of Botanical Observation and Criticism*. 1: 114-44. Washington, D.C., 1903-6.

⁶ Britton, Nathaniel Lord, and Brown, Addison. *An Illustrated Flora of the Northern United States, etc.* 2: 484. New York, 1913.

I. *Rhus quercifolia* (Michx.) Steud., Nom. Bot. ed. 1: 690 (1821)

R. Toxicodendron L., var. *quercifolium* Michx., Fl. Bor.-Am. 1: 183 (1803).

Toxicodendron compactum Greene, Leaflets, 1: 126 (1905).

T. monticola Greene, loc. cit. 126.

T. quercifolium Greene, loc. cit. 127.

Erect, 3–5 dm. high; leaflets broadly rhombic-ovate, conspicuously 3–7 lobed, permanently somewhat pubescent beneath (or rarely glabrous at maturity), rather firm in texture and somewhat veiny, 4–10.5 cm. long and .06–.22 mm. thick¹ (between veins); petals on male flowers 2–3 mm. long and 1 mm. wide; fruit 4–5 mm. in diameter, at first pubescent, in maturity papillose or pubescent, or less frequently glabrous; seeds smooth, 3.5–4.7 mm. long and 1.91–2.57 mm. thick (caliper measurement). April-May.

DISTRIBUTION: Woods and barrens, New Jersey, southward and westward to Texas.

SPECIMENS EXAMINED: ALABAMA: Auburn, 1898, F. S. Earle and C. F. Baker (R.Mt. 16714; F. 170945). DELAWARE: Laurel, 1874, A. Commons (U.S. 394275); Laurel, 1908, C. S. Williamson 1 (A.N.S.). FLORIDA: Levy Co., 1898, A. S. Hitchcock (F. 232712); Suwanee Co., 1898, A. S. Hitchcock (F. 232410). GEORGIA: Lookout Mt., 1898, A. Ruth (U.S. 345540); Taylor's Ridge, 1900, P. Wilson (U.S. 384663). LOUISIANA: Alexandria, J. Hale (A.N.S.). MARYLAND: Salisbury, 1878, Chickering (U.S. 43273). NEW JERSEY: Millville, 1909, B. Long (A.N.S.). NORTH CAROLINA: Wilmington, 1885, G. McCarthy (U.S. 19859). SOUTH CAROLINA: Columbia, 1912, E. B. Bartram (A.N.S. 551397); Manning, 1914, W. Stone 353 (A.N.S. 554265). VIRGINIA: Woodlawn, 1899, Wm. Hunter (U.S. 364962).

In New Jersey,² it is found in sandy ground in the lower middle district and Cape May peninsula, spreading into the pine barrens as a rare straggler. In Alabama,³ it occurs throughout the state in dry,

¹ The relative thickness of leaves having been employed as a character of specific importance in *Rhus*, measurements seemed necessary. Those given in this paper were made by a micrometer screw caliper (No. 2342 Catalogue "C," Central Scientific Co., Chicago, made by L. S. Starrett Co., Athol, Massachusetts). This caliper is graduated to read to 0.01 mm. It is provided with a friction head so that all measurements are made with the same pressure.

² Stone, Witmer. The Plants of Southern New Jersey with Special Reference to the Flora of the Pine Barrens. In Annual Report New Jersey State Museum, pp. 536–38. 1911.

³ Mohr, Charles. Plant Life of Alabama. Contributions from the U. S. National Herbarium. 6: 601. 1901.

sterile soil, barren hillsides, and pine barrens. In Mississippi,¹ it has been reported from sandy upland soil in Tishomingo Co.; Oxford; Jackson; Hattiesburg; Montrose.

Linnaeus in 1753, in his summing up of the previous plants of the genus, does not mention any with oak like leaves. Apparently, it is not until 1762 that there is any reference to such a plant, when its existence was noted by Gronovius.² It remained for Michaux,³ however, in 1803, to give the plant botanical recognition.

On the whole, the species exhibits its essential characteristics with remarkable uniformity. Three mature plants, however, from Georgia, North Carolina, and Texas have glabrous leaves. Also, in a very few instances, specimens were noted with seeds that showed a tendency toward the tubercled character of those of *R. Toxicodendron*. These may be hybrids.

2. *Rhus diversiloba* T. & G. Fl. N. Amer. 1: 218 (1838)

Rhus lobata Hooker, Fl. Bor.-Am. 1: 127 (1831).

Toxicodendron diversilobum Greene, Leaflets 1: 119 (1905).

T. coriaceum Greene, loc. cit. 120.

T. comarophyllum Greene, loc. cit. 120.

T. isophyllum Greene, loc. cit. 121.

T. oxyacarpum Greene, loc. cit. 121.

T. vacicarum Greene, loc. cit. 122.

Suberect and bushy, scrambling over fences, walls, etc., or in woods, climbing by rootlets to considerable heights, sparingly pubescent or glabrate, leaves pinnately 3—(rarely 5)—foliolate; leaflets very obtuse, entire, crenulate, or irregularly obtusely lobed, the incisions acute; paler and with some persistent or tardily deciduous pubescence beneath; panicles axillary, racemose; petals of female flowers 2–3 mm. long and 1–1.5 mm. wide, of male flowers 3–4 mm. long and 1–1.5 mm. wide; fruit whitish or cream-colored, subglobose, glabrous or nearly so, 4–7 mm. in diameter, sometimes sulcate in age; seeds 4–5.7 mm. long and 1.84–2.55 thick (caliper measurements); flattened and more or less irregularly roughened with knoblike protuberances. According to herbarium specimens, the plant flowers in Santa Catalina Island in February and March; in California, from April to June; and in Oregon and Washington, from April to August.

¹ Lowe, E. N. Plants of Mississippi. Mississippi State Geol. Survey Bulletin No. 17, p. 188. 1921.

² Gronovius, John Frederick. Flora Virginica, pp. 45–46. Lugduni Batavorum, 1762.

³ Michaux, Andreas. Flora Boreali-Americanæ. 1: 183. Paris, 1803 (Anno xi).

DISTRIBUTION: Borders of woods, etc., Washington, Oregon, and California.

SPECIMENS EXAMINED: CALIFORNIA: Big Chico Creek, 1914, A. A. Heller 11211 (F. 426609); Calaveras Co. 1887, B. H. Smith (A.N.S.); Chico, 1916, A. A. Heller 12321 (F. 460347); Little Chico Creek, 1896, Mrs. R. M. Austin 780 (U.S. 285227; 286258); Los Buillos Hills, 1906, C. S. Williamson (A.N.S.); Los Gatos, 1904, A. A. Heller 7327 (A.N.S. 510379; F. 215988); Los Gatos, 1889, B. F. Leeds (F. 403353); Mendocino, 1898, H. E. Brown 750 (F. 412997); Mt. Lowe, 1901, C. S. Williamson (A.N.S.); Oroville, 1913, A. A. Heller 10787 (A.N.S. 558128; F. 411335); Salinas Valley, 1880, G. R. Vasey 86 (U.S. 19804); San Jacinto, 1898, J. B. Leiberg (U.S. 342019); Santa Barbara, 1902, A. D. E. Elmer 3940 (F. 235586); Santa Catalina Island, 1922, E. C. Knopf 485 (F. 516143); 1920, C. F. Millspaugh 4716, 4734 (F. 496253; 496272); 1920, L. W. Nuttall 622 (F. 497126; 497127; 493350); 1912, H. H. Smith 5069 (F. 389415); Santa Cruz, 1884, J. Ball, (U. S. 292229); Saratoga Springs, 1888 (F. 403262); Sierra Valley, J. G. Lemmon 79 (F. 151861); Tighes, San Diego Co., 1875, E. Palmer 45 (F. 302931); 1878, E. Palmer (U.S. 19802). OREGON: Bridal Veil, Multnomah Co., 1910, H. H. Smith 3117 (F. 295650); The Dalles, 1906, J. Lunell (R.Mt. 56238); Hood River, 1898, T. E. Savage et al. (F. 92203); Multnomah Co., 1903, E. P. Sheldon S. 12087 (F. 217012); Portland, 1886, Drake and Dickson (F. 253592); 1890 (F. 253991); 1884, L. F. Henderson 176 (A.N.S. 549008); Salem, 1871, E. Hall (F. 455143); 1921, J. C. Nelson 3837 (A.N.S. 592684). WASHINGTON: Mercer Island, Seattle, 1895 (F. 366941); W. Klickitat Co., May 6–July, 1885, W. N. Suksdorf (F. 155984; 255875); 1885, W. N. Suksdorf (U.S. 19803).

Clavigero (1798) in his "Historia de la California" mentioned this plant under the name of "hiedra maligna" and among the Mexicans of today in California it is still known as "hiedra."

The plant was given botanical individuality when Hooker in 1831¹ called it *R. lobata* after examining a specimen obtained by Douglas at Fort Vancouver on the Columbia River.

Hooker and Arnott in 1832² considered the specimens obtained by Captain Beechey at San Francisco and Monterey, California, as similar to the more northern specimen. Perhaps the most marked character of this plant, compared with *R. Toxicodendron* L. as pointed out by Hooker, is its ovate and obtuse leaflets.

¹ Hooker, William Jackson. Flora Boreali-Americanana. 1: 127. London, 1831.

² Hooker, W. J., and Arnott, G. A. W. The Botany of Captain Beechey's Voyage. Part III: 137. London, 1832.

In 1839, Torrey and Gray¹ noticed that the name *R. lobata* had been used by Poiret in 1817.² As Poiret used the name for a species of *Rhus* entirely different from the plant of Hooker, Torrey and Gray renamed the plant *R. diversiloba*.

After examining many plants in herbaria and in the field, I am unable to substantiate the observation of Nuttall³ that the female plant has "almost entire or slightly lobed" leaflets, while the male "has rather deeply lobed leaflets." There seems to be no apparent difference between the sexes in this respect.

Like *R. Toxicodendron* L., it may have leaflets with an entire or crenate (or crenately lobed) margin. Entire leaflets and crenate leaflets may occur either on the same plant or on different plants. It also exhibits, when in good soil, the same tendency to climb trees, etc., by aerial rootlets, or it may grow as a shrub, and yet no one has made for it a variety "*radicans*," as was done for *R. Toxicodendron* L.

2a. Rhus diversiloba T. & G., forma *radicans*, f. nov.

Toxicodendron dryophyllum Greene, Leaflets, 1: 121 (1905).

SPECIMENS EXAMINED: CALIFORNIA: Little Chico Creek, Butte Co., 1896, Mrs. R. M. Austin 780 (U.S. 285287); Santa Catalina Island, "Extensively twining and rooting. Quite different habit from shrub," Millspaugh 4734 (F. 496272).

Few collections of this form have been made, but from personal observation it may be said that it is at least as common throughout the range of the shrub-form of *Rhus diversiloba* as the analogous forma *radicans* in the range of *Rhus Toxicodendron*. Although this climbing form of both species is probably an ecological or vegetative condition correlated with the vitality of the plant, taxonomic recognition as a form may be desirable.

3. *Rhus toxicodendron* L., Sp. Pl. 1: 266 (1753)

R. Blodgettii Kearney, Bull. Torr. Bot. Club 21: 486 (1894).

R. littoralis Mearns, Proc. Biol. Soc. Wash. 15: 148 (1902).

R. Toxicodendron Rydbergii Garrett, Spring Fl. Wasatch Reg. ed. 3: 69 (1917).

R. Toxicodendron var. *microcarpa* Michx., Fl. Bor.-Am. 1: 183 (1803).

R. microcarpa Steud., Nom. Bot. ed. 2: 452 (1840).

Toxicodendron divaricatum Greene, Leaflets 1: 122 (1905).

¹ Torrey, John, and Gray, Asa. A Flora of North America. 1: 218. New York, 1838.

² Poiret, J. L. M. Dictionnaire de Botanique Supplement 5. 264. Paris, 1817.

³ In Torrey and Gray. *Loc. cit.*

- T. arizonicum* Greene, loc. cit. 1: 123.
T. aboriginum Greene, loc. cit. 1: 125.
T. rhomboideum Greene, loc. cit. 1: 125.
T. rufescens Greene, loc. cit. 2: 46 (1910).
T. Rydbergii Greene, loc. cit. 1: 117 (1905).
T. Toxicodendron Britton, Britton and Brown, Ill. Fl. ed. 2, 2:
 484 (1913).
Rhus rhomboidea Small, Fl. Southeastern U. S. 727, 1334 (1903).
R. Toxicodendron Small, loc. cit.
R. Rydbergii Small, Mem. N. Y. Bot. Gard. 1: 268 (1900).
Toxicodendron Negundo Greene, loc. cit. 1: 117.
T. longipes Greene, loc. cit. 1: 118.
T. hesperium Greene, loc. cit. 1: 118.
T. lobadioides Greene, loc. cit. 1: 119.
T. punilum Greene, loc. cit. 1: 124.
T. punctatum Greene, loc. cit. 1: 125.
T. macrocarpum Greene, loc. cit. 1: 117.
T. desertorum Lunell, Am. Mid. Nat. 2: 185 (1912).
T. Fothergilloides Lunell, loc. cit. 186.

Erect or suberect and bushy, or scrambling over fences, walls, etc., or in woods even climbing by rootlets to considerable heights, sparingly pubescent or glabrate; leaflets pinnately 3-foliolate, ovate to rhombic, mostly acute, entire, serrate or irregularly and coarsely few-toothed, paler and with some persistent or tardily deciduous pubescence beneath, especially along the veins; length of terminal leaflet 3.7–19 cm.; panicles axillary; petals of female flower 2 mm. long, 1 mm. wide; of male 3–4 mm. long, 1–2 mm. wide; fruit whitish or cream-colored, sub-globose, normally glabrous or nearly so, sometimes pubescent when young (rarely persistent pubescence), 3–6 mm. in diameter, in age sometimes sulcate; seeds roughened similarly to those of *R. diversiloba*, 3–5 mm. long, 1.74–2.49 mm. thick (caliper measurements). According to herbarium specimens, it flowers in Mexico in February and March (in one locality June); in Florida and the Bahamas, February and March; in Texas, April; in Arizona, May to July; in Maine and Nova Scotia, July; in localities north and west of Virginia, May and June.

DISTRIBUTION: Abundant in hedgerows, thickets, and woods in Canada, United States, and Mexico between 15° and 50° north latitude except California.

Rhus Toxicodendron having leaves with serrate margins

SPECIMENS EXAMINED: BAHAMA ISLANDS: Andros, 1910, J. K. Small and J. J. Carter 8850 (F. 283834).

CANADA: ALBERTA: Rosedale, 1915, M. E. Moodie 1215 (F. 439452). NEW BRUNSWICK: Woodstock, 1916, Fernald and Long 14016 (A.N.S. 576285). NOVA SCOTIA: Bridgewater, 1921, Fernald and Long (A.N.S. 587814). PORT BEVIS: 1920, Fernald and Long 21792 (A.N.S. 588250). ONTARIO: Newburgh, 1896, W. R. Baker (F. 85618).

MEXICO: VICTORIA: 1907, *E. Palmer* 138165; 228 (F. 217477; 217506; 217578).

UNITED STATES: ARIZONA: Flagstaff, 1898, *D. T. Macdougal* 28 (F. 697784); Flagstaff, 1898, *D. T. Macdougal* (U.S. 334125); Fort Apache, 1901, *P. S. Mayerhoff* 47 (F. 113386); Grand Canyon, *C. F. Millspaugh* 122 (F. 69772); Willow Spring, 1874, *J. T. Rothrock* 254 (F. 303933). COLORADO: Boulder, 1906, *W. W. Robbins* (R.Mt. 56840); Boulder, 1902, *F. Tweedy* 4946 (R.Mt. 42996); Denver, 1891, *A. Eastwood* (F. 82260). FLORIDA: Marco, 1898, *A. S. Hitchcock* (F. 232095). GEORGIA: Bainbridge, 1895, *J. K. Small* (F. 180475). ILLINOIS: Edgebrook, 1906, *F. C. Gates* 1517 (F. 458944; 159487); Lake Bluff, 1881, *M. E. Hutchinson* (F. 101002); Leyden, 1905, *F. C. Gates* 745 (F. 458666); Liana, 1916, *F. C. Gates* 10016 (F. 472756); Romeo, 1898, *L. M. Umbush* (F. 94764); Springfield, 1861 (F. 13974); Starved Rock, 1909, *J. M. Greenman et al.* 66 (F. 248726); Waukegan, 1908, *F. C. Gates* 2506; 2805 (F. 344721; 344780); Winnebago Co., 1859 (F. 13975; 13976). INDIANA: Hanover, 1876, *J. M. Coulter* (F. 363331); Whiting, 1899, *O. E. Lansing, Jr.* (F. 68011). IOWA: Johnson Co., 1895, *T. J. Fitzpatrick* (F. 123607). KANSAS: Riley Co., 1895, *J. B. Norton* (U.S. 352742); 1896 (U.S. 352743); Riley Co., 1896, *J. B. Norton* 73a (R.Mt. 18888); Syracuse, 1893, *C. H. Thompson* (U.S. 265734). LOUISIANA: Alexandria, 1899, *C. R. Ball* 429 (F. 93465). MAINE: Fairfield, 1916, *Fernald and Long* 14017; 14018 (A.N.S. 576286; 578022). MARYLAND: Savage Sta., 1905, *C. S. Williamson* (A.N.S. 524661). MICHIGAN: Hamlin Lake, 1910, *R. W. Chaney* 210 (F. 296953). MONTANA: Ravalli, 1908, *Mrs. J. Clemens* (F. 345138). NEBRASKA: Gage Co., *W. C. Knight* (R.Mt. 172). NEW JERSEY: Bennett, 1910, *B. Long* 5170 (A.N.S.); Folsom, 1910, *B. Long* 4299 (A.N.S.). NEW MEXICO: Black Range, *O. B. Metcalfe* 1088 (U.S. 498281); Kingston, 1904, *O. B. Metcalfe* 1088 (F. 187484); Magdalena Mts., 1910, *J. Herrick and R. Herrick* 70 (F. 292657). NEW YORK: Cheming Co., 1896, *T. F. Lucy* 7793 (F. 3551); Cheming Co., 1896, *T. F. Lucy* (F. 140325; R.Mt. 21947); Glenwood Ravine, 1888, *C. F. Millspaugh* (F. 18506); Troy, 1834 (F. 476882). NORTH CAROLINA: Tryon, 1918, *C. F. Millspaugh* 4060 (F. 479441). NORTH DAKOTA: Grand Forks, 1894, *C. A. Egebretson* 148 (F. 352080). OKLAHOMA: Woods Co., 1900, *P. J. White* (R.Mt. 26792). OREGON: Deshutes River, 1885, *T. Howell* (F. 150943). PENNSYLVANIA: Mercersburg, 1845 (A.N.S.); Nottingham Barrens, 1914, *F. W. Pennell* 1558 (A.N.S.); Perkiomen, 1892, *J. B. Brinton* (A.N.S.); Philadelphia, 1921, *R. R. Dreisbach* (F. 531925); Westmoreland, 1877, *P. E. Pierron* (F. 154294). SOUTH DAKOTA: *S. A. Skinner* (R.Mt. 61824); Ashcroft, 1910, *S. S. Visher* (R.Mt. 69869); Bald Hills, 1910, *J. Murdoch, Jr.*

4092 (F. 471322); Deadwood, 1913, *W. P. Carr* 83 (F. 468198); Edgemont, 1911, *S. S. Visher* 2569 (F. 386301); Fall River Co., 1911, *S. S. Visher* 2569 (R.Mt. 76332); Harding Co., 1910, *S. S. Visher* 244 (F. 385898); Piedmont, 1895, *A. D. Pratt* (F. 140405; R.Mt. 9235). TEXAS: Hempstead, 1872, *E. Hall* 78 (F. 453952); Kerrville, 1894, *A. A. Heller* 1670 (F. 17075); Tammart Co., 1920, *A. Ruth* 941 (F. 507859). UTAH: 1875, *L. F. Ward* 212 (F. 106360); City Creek Canyon, 1880' *M. E. Jones* 1932 (F. 252602; 475769); Glenwood, 1875, *L. F. Ward* 212 (U.S. 153641). VERMONT: Charlotte, 1879, *F. H. Hosford* (F. 354-348). VIRGINIA: (opposite Georgetown, D.C.), *A. Schott* (F. 44175); Great Falls, 1909, *C. S. Williamson* (A.N.S.). WISCONSIN: Elkhart Lake, 1884, *J. H. Schuette* (F. 351000); Green Bay, 1906, *J. H. Schuette* (F. 378276); Milwaukee, *I. A. Lapham* (A.N.S.); Richland Center, 1912, *O. E. Lansing, Jr.* 3408 (F. 323983). WYOMING: Freezeout Hills, 1898, *E. Nelson* (R.Mt. 12331); Hartville, 1894, *A. Nelson* (R.Mt. 3733); Norwood Hill, 1912, *E. P. Walker* 498 (R.Mt. 75747); Pole Creek, 1894, *A. Nelson* (R.Mt. 3958); Upper Goose Creek Ditch, 1909, *V. Willets* 188 (R.Mt. 68884).

Rhus Toxicodendron having leaves with entire margins

SPECIMENS EXAMINED: BERMUDA: Boaz Island, 1912, *S. Brown* 1005 (A.N.S. 556483); Paget Marsh, 1905, *S. Brown* (A.N.S. 511291); Tuckers Town, 1908, *S. Brown* 499 (A.N.S. 534730).

GREAT BAHAMA: 1905, *L. J. K. Brace* 3570 (F. 184239); 1905, *Britton* 2446 (F. 173562).

CANADA: NOVA SCOTIA: East Bridgewater, 1910, *J. Macoun* 81289 (F. 295036); East Jordan, 1921, *Fernald and Long* 24095 (A.N.S. 589438); Yarmouth, 1920, *Pease and Long* 21785 (A.N.S. 588259).

MEXICO: Cuyameralis de Cuicatlan, 1909, *Consatti* 2409 (F. 246942); Morelia, 1909, *T. Maria* 10 (F. 387369); San Luis Potosi, 1878, *Parry and Palmer* 124 (A.N.S.); Sierra del Pajarito, 1855, *A. Schott* (F. 42195).

JAPAN: Island of Jesso, 1861, *Albrecht* (F. 53316).

UNITED STATES: ARIZONA: Fort Huachuca, 1890, *Palmer* 453a (U.S. 19847); Lowell, 1884, *W. F. Parish* 217 (F. 152917); Santa Catalina Mts., 1894, *J. W. Toumey* (U.S. 441725; 619140; 664167). DELAWARE: Ruthby, 1897, *A. Commons* (A.N.S. 541741). DISTRICT OF COLUMBIA: Washington, 1893, *L. L. J. Boettcher* 250 (F. 286579; R.Mt. 68107). FLORIDA: Alva, 1900, *Hitchcock* 39 (F. 101118); Palm Beach, 1908, *W. Garvens* (F. 224033); Palm Beach, 1895, *Hitchcock* (F. 232708). GEORGIA: Milledgeville, *S. Boykin* (A.N.S.). ILLINOIS: Joliet, 1904, *H. C. Skeels* (F. 177229). MAINE: Mt. Desert Island, 1890, *J. H. Redfield* (A.N.S.); Winn, 1916, *Fernald and Long* 14014

(A.N.S. 576283). MASSACHUSETTS: Bolton, 1910, *C. H. Knowlton* (A.N.S. 562021); Falmouth, 1904, *A. H. Moore* 1775 (F. 468774); Falmouth, 1911, *Pennell* 3176 (A.N.S. 546542); Middleboro, 1900, *J. Murdock, Jr.* 527 (F. 469864). MISSOURI: Vulcan, 1908, *H. H. Smith* 441 (F. 240812). MONTANA: Bozeman, 1905, *J. W. Blankinship* 106 (F. 190151). NEW JERSEY: Cape May Court House, 1911, *B. Long* 6671 (A.N.S.); Folsom, 1911, *B. Long* 5936 (A.N.S.); Tomlin, 1911, *B. Long* 6822 (A.N.S.). NEW MEXICO: Kingston, 1904, *O. B. Metcalfe* (U.S. 890258). OREGON: Deshutes River, 1885, *Howell* (F. 366-339). PENNSYLVANIA: Philadelphia, 1908, *S. S. Van Pelt* (A.N.S.). SOUTH CAROLINA: Manning, 1914, *W. Stone* 505 (A.N.S. 554417). TEXAS: Willis, 1908, *R. A. Dixon* 292 (F. 238230). VIRGINIA: Hacker Valley, 1908, *H. H. Smith* 1532 (F. 241984); Little Falls, *C. F. Millspaugh* (F. 24465); Ocean View, 1898, *T. H. Kearney, Jr.* 1759 (U.S. 346424); Virginia Beach, 1893, *N. L. Britton et al.* (F. 394587). WASHINGTON: Spokane, 1898, *T. E. Savage et al.* (F. 93077); Spokane, 1912, *G. W. Turesson* (R.Mt. 76339); Wenatchee, 1893, *K. Whited* 241 (U.S. 268197).

Rhus Toxicodendron having leaves with entire and serrate margins on the same plant

SPECIMENS EXAMINED: BAHAMA ISLANDS: New Providence, 1905, *E. G. Britton* 3416 (F. 184117); North Cat Cay, 1904, *C. F. Millspaugh* 2336 (F. 156302).

CANADA: Five Mile River, N. S., 1920, *A. S. Pease* and *B. Long* 21788 (A.N.S. 588113).

MEXICO: St. Diego, 1891, *C. V. Hartman* 589 (U.S. 306052; F. 49-631); Tunicachi, 1890, *C. V. Hartman* 102 (U.S. 306157).

UNITED STATES: ARIZONA: Chiricahua Mts., 1907, *J. C. Blumer* 1325 (F. 242184). FLORIDA: Lake City, 1898, *A. S. Hitchcock* (F. 232-709); Lake City, 1901, *L. McCulloch* 45 (U.S. 440443); Tampa Bay, 1893, *P. H. Rolfs* 247 (F. 228840). ILLINOIS: Glencoe, 1877, *M. Bross* (F. 103924); Peoria, *J. T. Stewart* (F. 114587); Stony Island, 1914, *H. H. Smith* 6033 (F. 417145). KANSAS: Riley Co., 1895, *J. B. Norton* 73 (R.Mt. 19505). LOUISIANA: Alexandria, *J. Hale* (A.N.S.). MAINE: Monticello, 1916, *Fernald* and *Long* 14015 (A.N.S. 576284). MISSOURI: Independence, 1921, *B. F. Bush* 9365 (F. 504307). NEW JERSEY: 1911, *B. Long* 6306 (A.N.S.); Farmingdale, 1910, *B. Long* and *S. Brown* 96 (A.N.S.); Locust Grove, 1911, *B. Long* 6492 (A.N.S.). NORTH DAKOTA: Devil's Lake, 1902, *J. Lunell* (R.Mt. 39163). PENNSYLVANIA: Allentown, 1922, *H. W. Preiss* 11394 (A.N.S.); Conewago, 1889, *J. K. Small* (F. 117542); Grenoble, 1910, *B. Long* (A.N.S.); Harrisburg, 1888, *J. K. Small* (F. 177717; 177718); Mifflin Co., *J. T. Rothrock*

(F. 321404); Pittsburgh, 1884, *J. A. Shafer* 544 (F. 18508); Westmoreland Co., 1876, *P. E. Pierron* (F. 154296). VIRGINIA: Marion, 1892, *N. L. Britton et al.* (F. 394767). VERMONT: Johnson, 1894, *A. J. Grout* (F. 428782).

Rhus Toxicodendron L. was probably the first poisonous species of *Rhus* discovered in North America. It was perhaps first noticed by Captain John Smith in 1609, and in 1635 Cornutus gave it botanical status as *Edera trifolia canadensis*. Since that time it has been divided into many species and varieties by many botanists.

It may readily be distinguished from *R. diversiloba* and *R. quercifolia* by its acute leaflets, as those of both the other species are obtuse. The leaf-margins and seed shapes are also different, as shown in the key.

Tracings of the outlines of leaves may be found on Plates XVIII–XXIII. These have been taken from all parts of North America between lower Canada and lower Mexico, with the exception of California (where, apparently, it does not grow). Its terminal leaflets in the north are generally ovate and in some cases nearly circular, while toward the south, especially in Lower California, Arizona, Florida, Mexico, and the Bahamas, they seem more likely to assume a lanceolate shape.

The plant may climb trees, etc., by means of aerial rootlets, but frequently remains suberect and bushy. Soil conditions may have a great deal to do with its habit, for in barren sandy soils the climbing form is not known to occur, while in fertile soils the radicanth is frequently met with. For instance, the sand dunes of Indiana have only the low form, but in the neighborhood of Laporte, Indiana, on more fertile soil, the climbing form is found. "This species of so wide a range shows many variations, some of which have been described as species. This fact led the writer, who is immune to ivy poisoning, to make an intensive study of the form in this State (Indiana). Especial attention was given to the study of the erect forms; those with thick and nearly smooth leaves; and those with hairy fruit. Hundreds of plants have been examined and from these, 78 sheets from 58 counties have been collected. The study suggests that the low erect forms are branches of underground stems; that the thick-leaved forms are always found in places exposed to heavy winds and direct sunlight; and that the hairy-fruited forms are rare and are distributed throughout our area, and have no other character to distinguish them."¹

¹ Deam, Charles C. Shrubs of Indiana, p 176. Publications of the Department of Conservation, State of Indiana, No. 4. Indianapolis, December, 1924.

A CORRECTION

Rhus Greenei, nom. nov.

Toxicodendron divaricatum Greene, Leaflets, I: 122 (1905).

Rhus divaricata (Greene) McNair, Field Mus. Pub. Bot. IV: 69 (1925), not *R. divaricata* Eckl. & Zeyh. Enum. Pl. Afr. 146 (1834-37).

In my paper on the taxonomy of poison ivy, *Toxicodendron divaricatum* Greene was transferred to *Rhus* as *Rhus divaricata*. I was unaware at the time that the name had already been used for an entirely different and presumably valid African species. *Toxicodendron divaricatum* Greene must, therefore, be renamed.

April 6, 1925.

In the Sandy River Valley in Maine, Knowlton¹ found only the prostrate vine. In New Jersey, Stone² found the shrubby form in sandy ground in the lower part of the middle district and Cape May peninsula spreading into the Pine Barrens as a rare straggler, while the vine-like form was found in low woods and along fence rows in the northern, middle, and coast districts and was absent from the Pine Barrens "except as an incursion." In Mississippi, Lowe³ found the vinelike form throughout the state climbing over trees, while the shrub was found only on sandy upland soil. In Alabama, Mohr⁴ found the vine-like form in rich, damp woods and bottom lands, while the shrub was found in dry, sterile soil, barren hillsides, and pine barrens. Peterson in his *Flora of Nebraska*⁵ found the vinelike form commonly in woods and along fences in Lincoln; while the shrub was an inhabitant of open woods and prairies, as found in Kearney, Long Pine, Minden, Newcastle, and Valentine.

The plant has female flowers with petals 2 mm. long and 1 mm. wide; male flowers with petals 3-4 mm. long and 1.5 mm. wide; fruit 3-5 mm. long with seeds 3-4.5 mm. long and 1.74-2.29 mm. thick. The seeds have knoblike protuberances which make them readily distinguishable from those of *R. diversiloba* and *R. quercifolia*.

The terminal leaflets vary from 3.7-12 cm. in length and are larger in the shade than in sunny locations. Dried herbarium leaves show a difference in thickness between .06 and .18 mm. Dried specimens of leaves grown in the sun are thicker than those grown in the shade. Miss Turner⁶ states that in fresh material no appreciable difference in thickness occurs between leaves grown in the shade and leaves grown in the sun. However, she says that sunny leaves have more compact tissue, consequently, in dried material sunny leaves would be thicker.

In making measurements on material from many parts of North America (see Tables III, IV) no difference in thickness could be noticed between leaves from western and eastern grown plants. But, in general, lanceolate leaves from the South were thicker than other shapes.

Panicles may be large or small, dense or open, upright or pendulous.

¹ Knowlton, Clarence H. Flora of the Sandy River Valley in Maine. In *Rhodora*, 16: 14 (1914).

² *Loc. cit.*

³ *Loc. cit.*

⁴ *Loc. cit.*

⁵ P. 161. Plainview, Nebraska, 1923.

⁶ Turner, Helen. The Ecology of *Rhus Toxicodendron*. *Transactions of the Illinois State Academy of Science*. 15: 208-11 (1922).

Leaflets and growing parts of the plant are covered with short, deciduous hairs mostly disappearing at maturity, but, in general, leaflets of equal maturity have approximately the same amount of pubescence whether from eastern or western America. However, some specimens from the District of Columbia, New Jersey, and Texas have leaflets densely pubescent beneath even at maturity.

As appears from the list of specimens examined, there are many plants of *R. Toxicodendron* which possess both leaves with serrate and entire leaf-margins. These may be hybrids, but this point cannot be decided without breeding experiments. The habit of growth of *R. Toxicodendron* has no relation to size of petals or character of leaf-margin, size and shapes of seed (see Tables III, IV). In this connection, it should be remembered that *R. diversiloba* exhibits similar leaf variations, showing no concomitant differences in flower, seed, or habit.

The subdivision of the species must be made on characters other than leaf-margins. Of the hundreds of specimens examined, only a few exhibit variations that appear sufficiently important or constant to be worthy of recognition. These may be defined as follows:

- Plants erect, not developing aerial rootlets; leaflets acute or acutish, entire or very coarsely few-toothed; mature fruit glabrous; seeds somewhat kidney-shaped, roughened.....var. *typica*
 Plants developing aerial rootlets, often climbing.....3a. f. *radicans*
 Plants erect or suberect, without aerial rootlets
 Fruit pubescent; leaflets not deeply lobed...3b. f. *malacotrichocarpum*
 Fruit glabrous; leaflets deeply lobed, the lobes very acute
3c. var. *eximia*

3a. *Rhus Toxicodendron* L., forma *radicans* (L.) comb. nov.

Rhus radicans L., Sp. Pl. 266 (1753).

R. Toxicodendron, var. *radicans* Torr., Fl. N. and Mid. States, 1: 323 (1824).

R. Toxicodendron, a. *radicans* Dippel, Handb. Laubholzk. 2: 376 (1892).

R. Toxicodendron radicans Schelle, Beissner, Schelle and Zabel, Handb. Laub. Benen. 286 (1903).

R. floridana Mearns, Proc. Biol. Soc. Wash. 15: 149 (1902).

Toxicodendron vulgare (Mill.) Greene, Leaflets, 1: 115 (1905).

T. glabrum (Mill.) Greene, loc. cit. 1: 116.

T. pubescens (Mill.) Greene, loc. cit. 1: 116.

T. phaseoloides Greene, loc. cit. 1: 123.

T. laetevirens Greene, loc. cit. 1: 123.

T. goniocarpum Greene, loc. cit. 1: 125.

T. radicans, a. *normale* O. Ktze; Rev. Gen. 1. 154 (1891).

This is designated as a form only because it has occupied so prominent a place in literature, although its characteristic—a more or less climbing habit—scarcely entitles it to special taxonomic recognition.

3b. *Rhus Toxicodendron*, f. *malacotrichocarpum*

A. H. Moore, *Rhodora*, 11: 163 (1909).

DISTRIBUTION: Occasional throughout the eastern range of the species.

SPECIMENS EXAMINED: MAINE: Bristol, *Chamberlain and Dinsmore* 832 (G.H.); Wells, York Co., *Fernald and Long* 14018 (A.N.S.). NEW JERSEY: Cape May Court House, Cape May Co., B. *Long* 6671 (A.N.S.); Delair, Camden Co., B. *Long* 6306 (A.N.S.); Tomlin, Gloucester Co., B. *Long* 6822 (A.N.S.). PENNSYLVANIA: Grenoble, Bucks Co., B. *Long* 4581 (A.N.S.). BERMUDA: Boaz Island, S. *Brown and N. L. Britton* 1005 (A.N.S.).

. 3c. *Rhus Toxicodendron*, var. *eximia* (Greene) comb. nov.

Toxicodendron eximum Greene, Leaflets, 1: 123 (1905).

T. biternatum Greene, loc. cit. 1: 124.

Rhus eximia Standl., Contrib. U.S.Nat. Herb. 23: 668 (1923).

This variety apparently varies greatly from *R. Toxicodendron* only in its leaf-shape. It has a leaf shaped somewhat like the leaf of a Norway maple (see Plate XXIV), although some plants have unlobed serrate leaves in addition. The petals, fruits, and seeds are similar in shape and size to those of *R. Toxicodendron*.

It is found in Mexico in Durango, Morelia, Nuevo Leon, and Tamaulipas, and in the United States in Texas.

SPECIMENS EXAMINED: TEXAS: Eagle Nest, V. *Havard* (U.S. 156164). MEXICO: Durango, 1896, E. *Palmer* 106 (U.S. 305009; F. 51217); San Augustin, Morelia, 1910, *Arsene* (F. 417262).

4. *Rhus divaricata* (Greene) comb. nov.

Toxicodendron divaricatum Greene, Leaflets, 1: 122 (1905).

This species has entire leaves, but with a seed quite different in shape from typical *R. Toxicodendron* (see Plate XXIV). When further collections of this plant are made, it may prove to be only a variety of *R. Toxicodendron*. At present, however, in view of the rather marked difference in seed characters, as exhibited in the single specimen known, it seems best to retain the plant as a separate species.

SPECIMEN EXAMINED: LOWER CALIFORNIA: Calmali, 1898, C. A. Purpus (U.S. 38343, type).

THE QUESTION OF HYBRIDS

Without positive data based on breeding experiments, it may be idle to discuss the question of hybrids. However, it may be noted that the ranges of *R. quercifolia* and *R. Toxicodendron* overlap and, as these plants are closely related and insect-pollinated, hybrids possibly occur. Mohr¹ states that in Alabama the two plants have different flowering periods, *quercifolia* blooming in April and *Toxicodendron* in May, and that he has never met with forms intergrading between them. In North Carolina there also appears to be a difference in the flowering period according to herbarium specimens.

The ranges of *R. diversiloba* and *R. Toxicodendron* overlap in Oregon and Washington, as was observed by Howell. According to herbarium specimens examined by the author, their flowering periods also overlap and they are insect-pollinated. No forms suggestive of this cross have been observed.

¹Loc. cit.

TABLE I
RHUS QUERCIFOLIA (MICHX.) STEUD.

Location	Fruit Size (mm.)	Seed Size (mm.)	♂ Petal Size (mm.)	♀ Petal Size (mm.)	Petal Size (mm.)	Terminal Leaflet	
						Length (cm.)	Thickness (mm.)†
Alabama	5	4.0 x 1.92*	3 x 1	3 x 1	4-4.5	.06-.07	
Florida	5	4.0 x 1.92*	3 x 1	3 x 1	5.5	.16-.18	
Florida	5	4.0 x 1.92*	3 x 1	3 x 1	7.5-8.5	.20-.22	
Mexico	5	4.0 x 1.92*	3 x 1	3 x 1	10	.12	
Alabama	5-6	4.7 x 2.57	3 x 1	3 x 1	5.3	.08	
North Carolina	5-6	4.2 x 2.19	3 x 1	3 x 1	7-7.5	.18	
Maryland	4	3.7 x 1.93	3 x 1	3 x 1	6.5-8.5	.16-.18	
Texas	4	4.0 x 2.08	3 x 1	3 x 1	6-7	.11-.14	
Georgia	5	4.0 x 1.91	3 x 1	3 x 1	7-8	.17-.18	
Virginia	5-6	3.5 x 2.12	3 x 1	3 x 1	6.5-9.0	.13-.20	
Georgia	5-6	4.5 x 2.20	3 x 1	3 x 1	7-8	.12-.14	
Delaware	5	4.0 x 2.01	3 x 1	3 x 1	7-7.5	.14-.19	
North Carolina	5	4.0 x 2.01	2 x 1	2 x 1	6.5-8.5	.12-.15	
South Carolina	4-5	4.0 x 2.01	2 x 1	2 x 1	7-8.5	.16	
South Carolina	5-6	4.0 x 2.49	2 x 1	2 x 1	7.5-8.5	.20-.22	
Louisiana	5-6	4.0 x 2.30	2 x 1	2 x 1	6-7	.17-.19	
New Jersey	5-6	4.0 x 2.10	2 x 1	2 x 1	6-7	.13	
New Jersey	5-6	4.0 x 2.10	2 x 1	2 x 1	9-10.5	.11-.13	

*Figures in this column to right of multiplication signs are caliper measurements.

†Caliper measurements.

TABLE II
RHUS DIVERSILoba T. & G.

Location	Fruit Size (mm.)	Seed Size (mm.)	♂ Petal Size (mm.)	♀ Petal Size (mm.)	Terminal Leaflet	
					Length (cm.)	Thickness (mm.)†
Oregon	.	.	.	.	3	.12-.14
Hood River, Oregon	.	.	.	.	6-7	.13
Sierra Valley, California	6	.	3 x 1	.	5.5-6.0	.08-.13
Columbia River, Washington	6-7	5.5 x 2.13*	3.5 x 1.5	.	5.2-6.2	.14
Los Gatos, California	.	.	.	.	6	.09
Rocky Butte, Oregon	.	.	.	.	.	.
Santa Barbara, California	.	.	.	.	.	.
Portland, Oregon	.	.	.	.	.	.
Columbia River, Washington	4-6	5.0 x 2.02	2.5 x 1	.	6-6.5	.11
Bridal Veil, Oregon	6	5.0 x 1.99	2 x 1	.	4.3	.08
San Diego Co., California	5	4.5 x 1.84	2.5 x 1.5	.	4.5-5.0	.16-.17
Saratoga, California	.	.	.	.	6	.08-.11
Oroville, California	5-7	5.7 x 2.53	2 x 1	.	6-6.5	.12
Big Chico Creek, California	.	.	3 x 1	.	3.5-4.0	.09
Salem, Oregon	6	.	3 x 1	.	.	.
Santa Catalina Island, California	.	.	2.5 x 1	.	6	.06-.11
Santa Catalina Island, California	6	5.0 x 2.54	3 x 1.5	.	7.5	.12
Santa Catalina Island, California	5-6	5.0 x 2.55	2.5 x 1	.	5.5-7.5	.14
Santa Catalina Island, California	4-5	4.0 x 1.87	4.0 x 1.87	.	5.5-6.0	.17

*Figures in this column to right of multiplication signs are caliper measurements.

†Caliper measurements.

TABLE III
R. TOXICODENDRON HAVING LEAVES WITH ENTIRE MARGINS

Location	Fruit Size (mm.)	Seed Size (mm.)	♂ Petal Size (mm.)	♀ Petal Size (mm.)	Terminal Leaflet	
					Length (cm.)	Thickness (mm.)†
West Virginia	4	3.0 x 1.90*	3.5 x 1.5	—	8	.10-.12
Washington	4	3.0 x 1.90*	—	—	9.5-11.0	.06-.08
Florida	—	—	—	—	11-12	.07-.09
Arizona	—	—	4 x 1.5	—	8.5	.08-.10
Florida	4-5	3.5 x 1.74	—	—	3.7	.15-.18
Bahamas	—	—	—	—	7	.13-.15
Illinois	—	4.0 x 2.24	—	—	10.5	.07-.08
Bahamas	—	3.5 x 1.91	—	—	5.5	.18
Montana	—	—	—	—	7.5	.09-.11
Florida	4	—	3 x 1.5	—	7.5-8.0	.06-.09
Florida	—	—	—	—	7	.11
Florida	—	—	—	—	5.5-5.8	.09
Texas	3-4	—	—	—	9-10.5	.09-.11
Missouri	—	—	3 x 1.5	—	10.5-11.0	.06-.11
West Virginia	—	—	—	—	10.5	.08-.13
District of Columbia	—	4.5 x 1.96	—	—	11	.08
Nova Scotia	—	—	—	—	7.5-10.5	.07
Oregon	4-5	4.0 x 1.99	—	—	6	.09-.11
Minnesota	—	4.0 x 2.29	—	—	8.5	.08
Virginia	—	—	—	—	7	.07-.08
Massachusetts	—	—	—	—	4.5-5.0	.12
Massachusetts	—	—	—	—	10.5-12.0	.06-.07
Washington	—	—	—	4 x 1.5	13	.11-.13
District of Columbia	—	—	—	—	10	.09-.10
	4.0 x 1.90	—	—	—		

*Figures in this column to right of multiplications sign are caliper measurements.

†Caliper measurements.

TABLE IV
R. TOXICODENDRON HAVING LEAVES WITH SERRATE MARGINS

Location	Fruit Size (mm.)	Seed Size (mm.)	σ^2 Petal Size (mm.)	♀ Petal Size (mm.)	Terminal Leaflet	
					Length (cm.)	Thickness (mm.)†
New York	...	...	4 x 1*	...	6.5-8.5	.06-.07
Illinois	...	...	3 x 1.5	...	10-12.5	.07-.09
Illinois	...	...	4-2-2.2	...	7-9	.08-.11
Illinois	4-5	...	4.5-2.46	...	10.5	.09-.11
District of Columbia	...	...	...	3.5 x 1.5	8	.07-.08
Arizona	...	...	...	...	4.7-8.0	.07-.11
Arizona	5	...	4-0-2.1	...	...	...
Colorado	...	...	...	...	5-5.2	.09-.10
Ontario	...	...	...	2 x 1	6-6.5	.07
Louisiana	...	...	...	...	10-12	.10
Illinois	...	...	...	...	11-13.5	.08-.10
Illinois	...	...	...	...	10-11.5	.06
Utah	5	4.0 x 2.11	...	...	6.5-7.5	.09-.11
Arizona	...	...	...	...	6.5	.15-.19
Iowa	...	...	...	2 x 1	...	...
New York	...	...	4 x 1.5	...	7.5-9.5	.06
South Dakota	5	4.5 x 2.07	...	...	8-9.5	.08-.10
Oregon	5	...	...	...	5	.09
Pennsylvania	...	...	...	...	9-9.5	...
Texas	...	...	...	...	4-5.5	.08
Georgia	...	...	...	...	8-9	.09-.10
New Mexico	...	...	...	...	9.5	.09-.10

*Figures in this column to right of multiplication signs are caliper measurements.

†Caliper measurements.

TABLE IV—Continued
R. TOXICODENDRON HAVING LEAVES WITH SERRATE MARGINS

Location	Fruit Size (mm.)	Seed Size (mm.)	♂ Petal Size (mm.)	♀ Petal Size (mm.)	Length (cm.)	Terminal Leaflet	
						Petal Size (mm.)†	Thickness (mm.)†
Illinois	•	•	•	•	•	•	.08
Illinois	•	•	•	•	•	8-10	.08
Utah	•	•	•	•	•	7.5	.06-.07
Bahamas	•	•	•	•	•	6.5	.07-.08
New Mexico	•	•	4.5 x 2.09*	•	•	7-9	.08-.10
Michigan	•	•	4.5 x 2.22	•	•	9-11	.10-.11
Wisconsin	•	•	4.5 x 2.22	•	•	6.5	.08-.09
Illinois	•	•	4.5 x 2.14	•	•	7.2	.06
Illinois	•	•	4.5 x 1.96	•	•	5-6	.15
Montana	•	•	•	•	•	6-10.5	.08-.11
Wisconsin	•	•	4.6	4.5 x 2.49	•	9.5	.09
North Dakota	•	•	5-6	5.0 x 2.29	•	6.5	.18
Vermont	•	•	5-6	4.5 x 2.22	•	8	.08-.09
Indiana	•	•	•	4.0 x 2.07	•	8-13	.12-.14
Wisconsin	•	•	•	•	•	12.5	.11
South Dakota	•	•	•	•	•	5.7	.11
Alberta	•	•	•	•	•	5.5-6.0	.08-.15
South Dakota	•	•	6	5.0 x 2.34	•	6	• • •
Texas	•	•	•	•	•	7	.12
Illinois	•	•	5-6	4.0 x 2.01	•	10.5-14.0	.06-.09
Illinois	•	•	•	•	•	13-19	.06-.08
South Dakota	•	•	5	•	•	7-7.5	.06-.10

TABLE IV—Continued
B *TOXICONDENDRON* HAVING LEAVES WITH SERRATE MARGINS

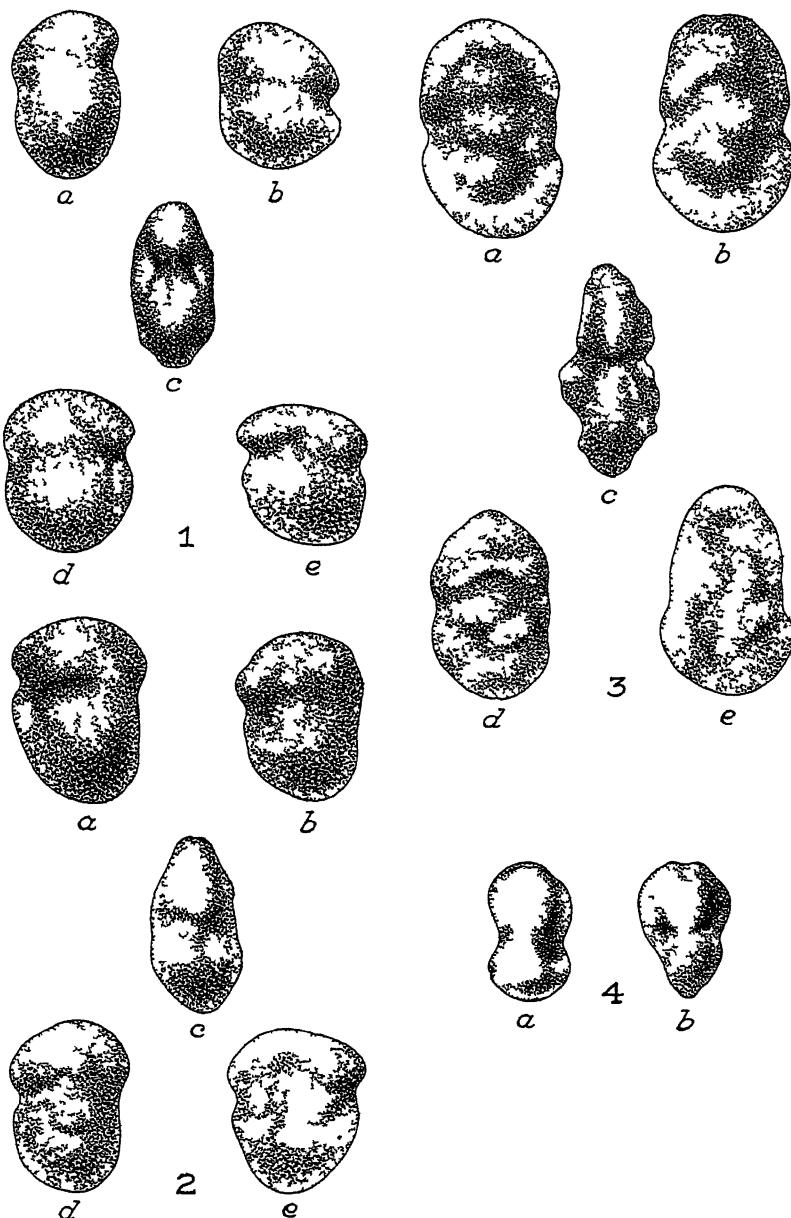
Location	Fruit Size (mm.)	Seed Size (mm.)	σ^2 Petal Size (mm.)	♀ Petal Size (mm.)	Terminal Leaflet	
					Length (cm.)	Thickness (mm.)†
South Dakota			3.5 x 1		6.5	.13-.15
Illinois			3.5 x 1	9.5-11.0		
New Mexico			3.5 x 1	7.5	.07-.12	
Utah			3 x 1.5			
New York			3.5 x 1.5			
North Carolina			3.5 x 1.5			
Texas	4					
Pennsylvania	5-6		5.0 x 2.34*			
Wyoming						
South Dakota						
South Dakota						
Wyoming						
South Dakota	6		4.0 x 1.9		7.5	.05-.07
Colorado	6		4.5 x 1.8		5	
Oklahoma			5.0 x 2.49			
Nebraska						
Wyoming						
Wyoming	5		4.0 x 1.90			
South Dakota	5-5.5		4.0 x 2.1			
New York						
Kansas						
Colorado						

PLATE XIV.

- Fig. 1. Seeds of *Rhus quercifolia*: *a, b, d, e* views from side, *c* view from below.
Fig. 2. Seeds of *Rhus Toxicodendron*: *a, b, d, e* views from side, *c* view from below.
Fig. 3. Seeds of *Rhus diversiloba*: *a, b, d, e* views from side, *c* view from below.
Fig. 4. Seeds of *Rhus divaricata*: *a* view from side, *b* view from below.

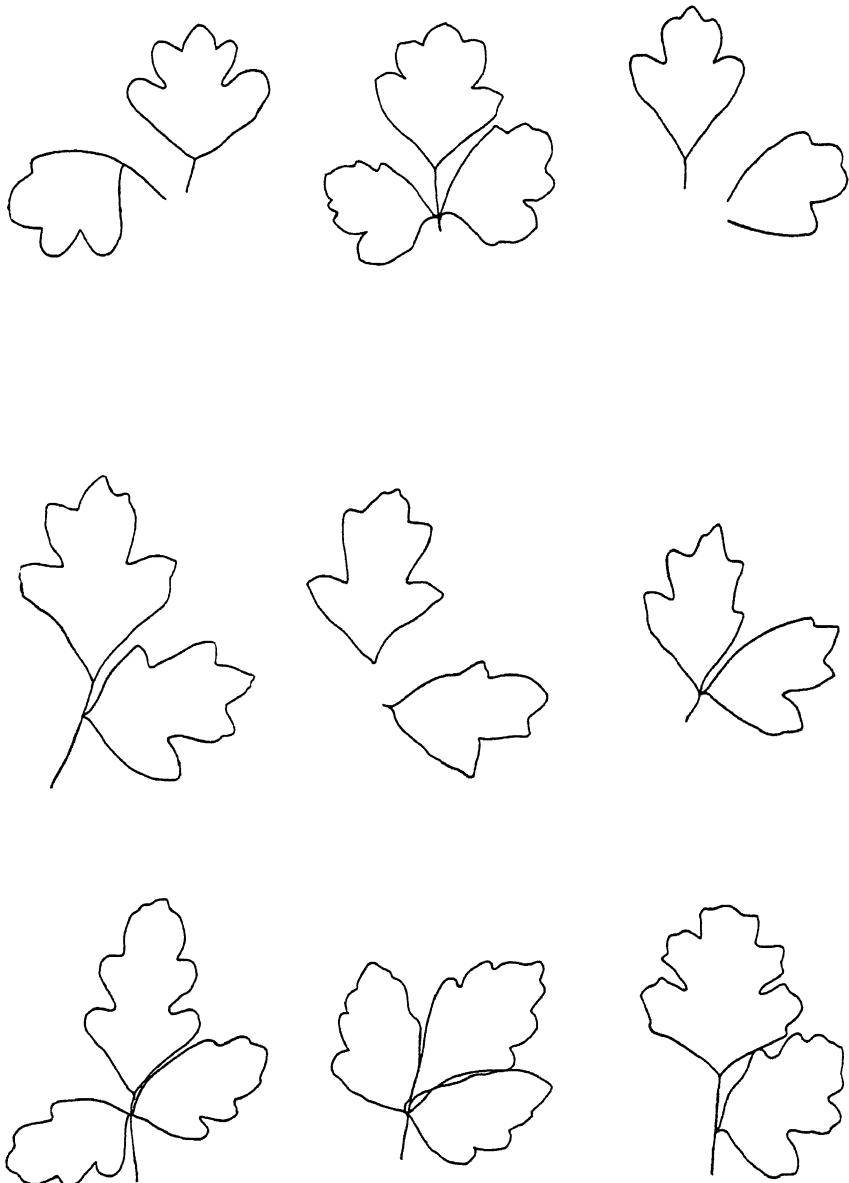
PLATES XV - XXIV.

The originals of the tracings reproduced, made from specimens cited in this paper, are deposited in the herbarium of the Field Museum, and bear the author's notations indicating the source of each.

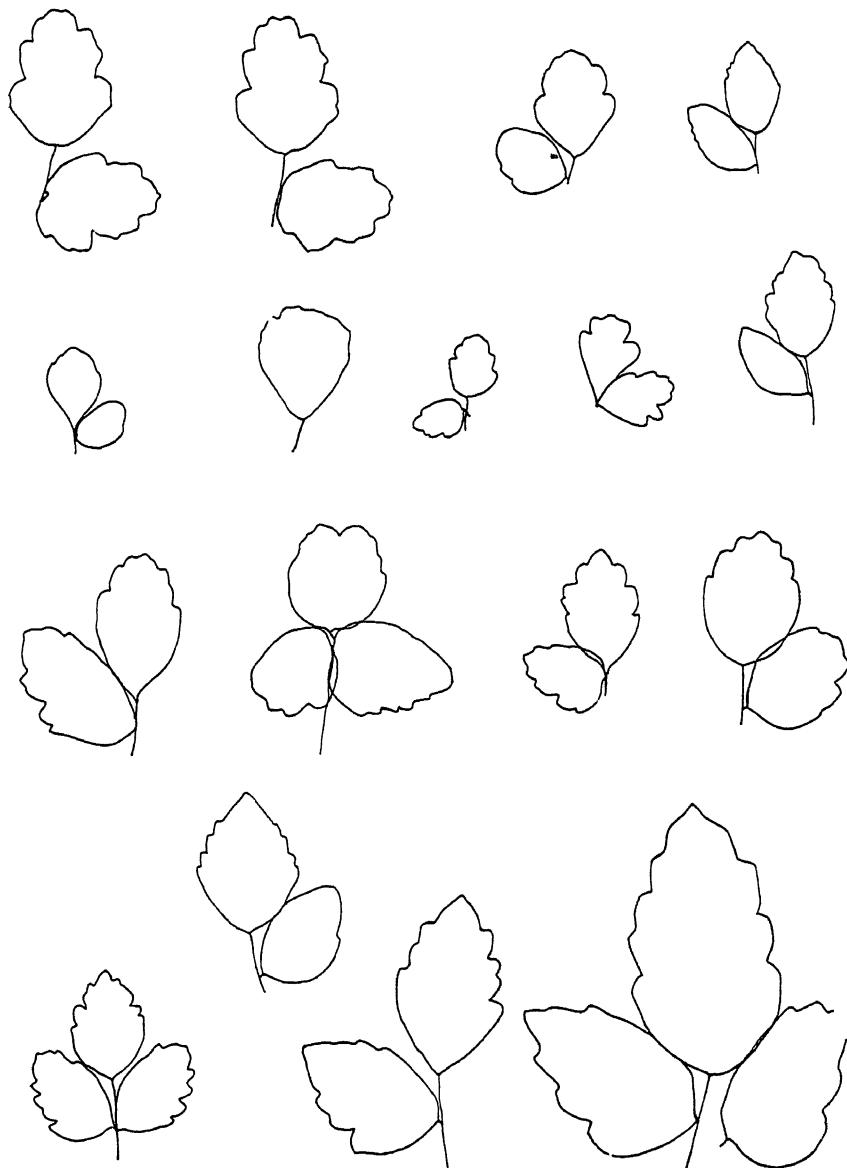


Carl F Gronemann del

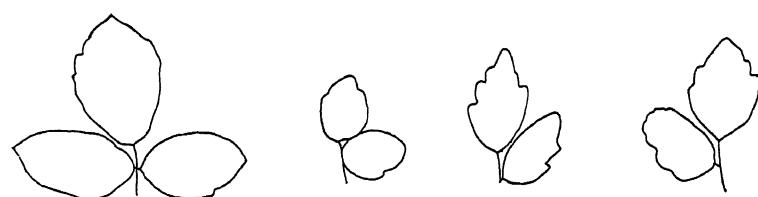
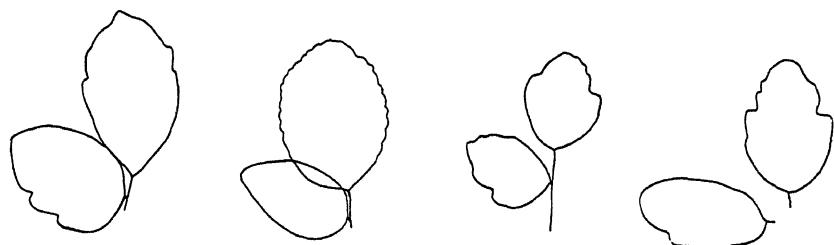
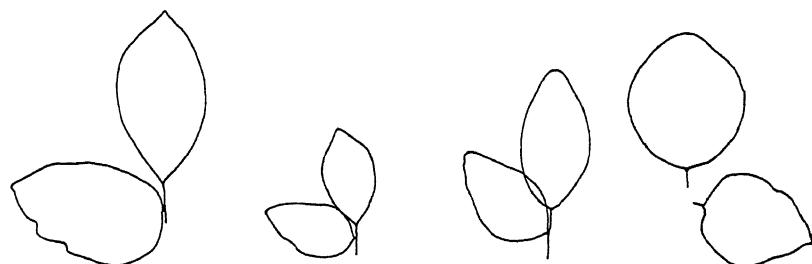
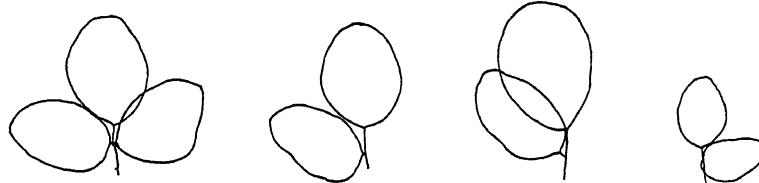
RHUS SEEDS (x 4)



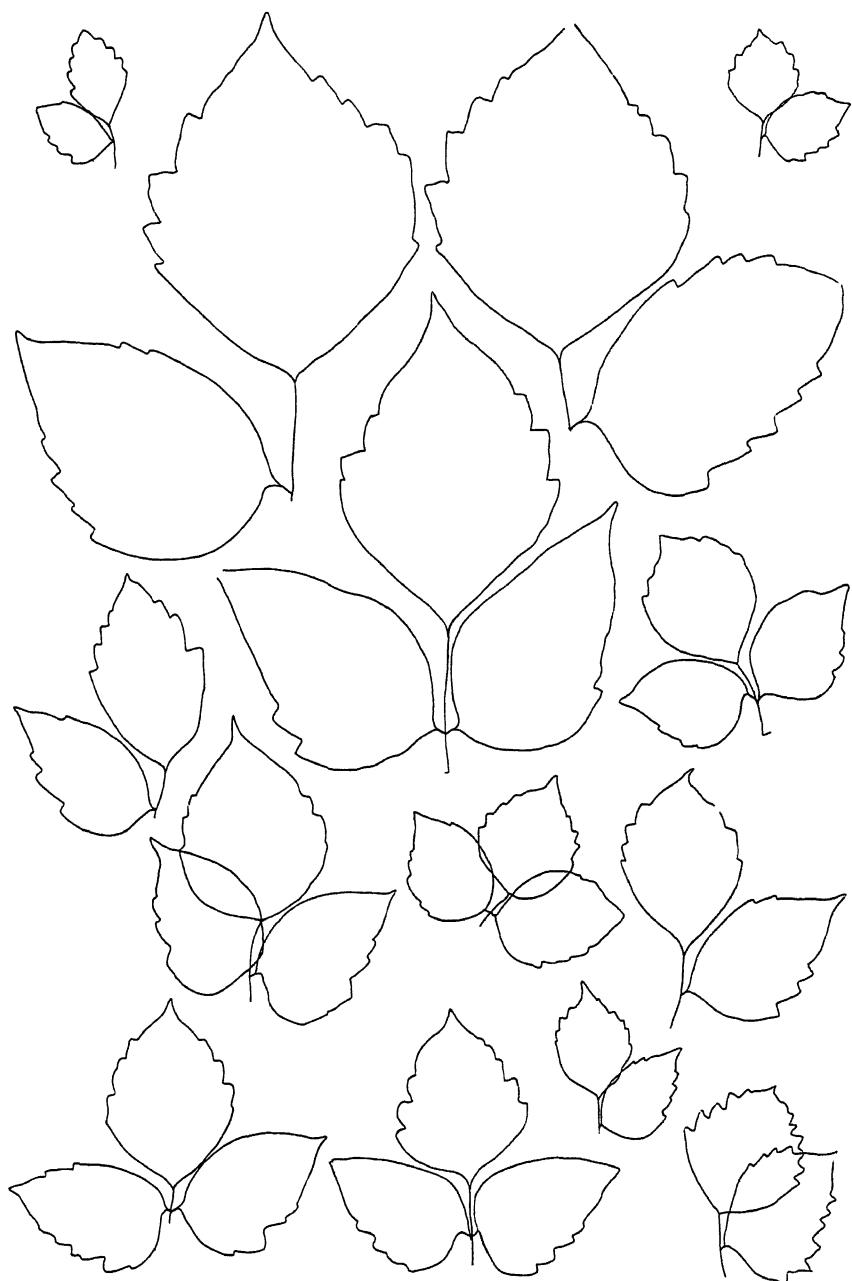
RHUS QUERCIFOLIA LEAF TRACINGS (x 1)



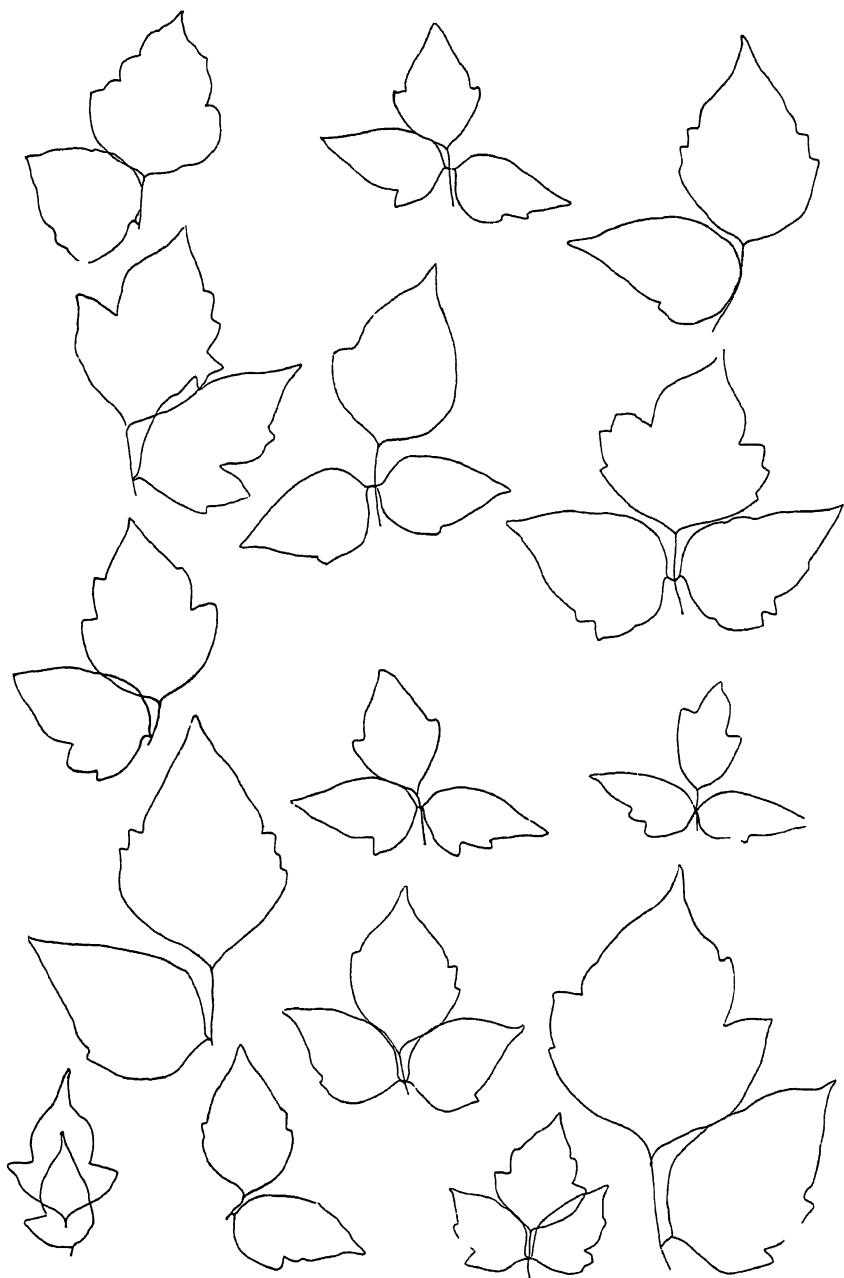
RHUS DIVERSILOBA LEAF TRACINGS ($\times \frac{1}{2}$)



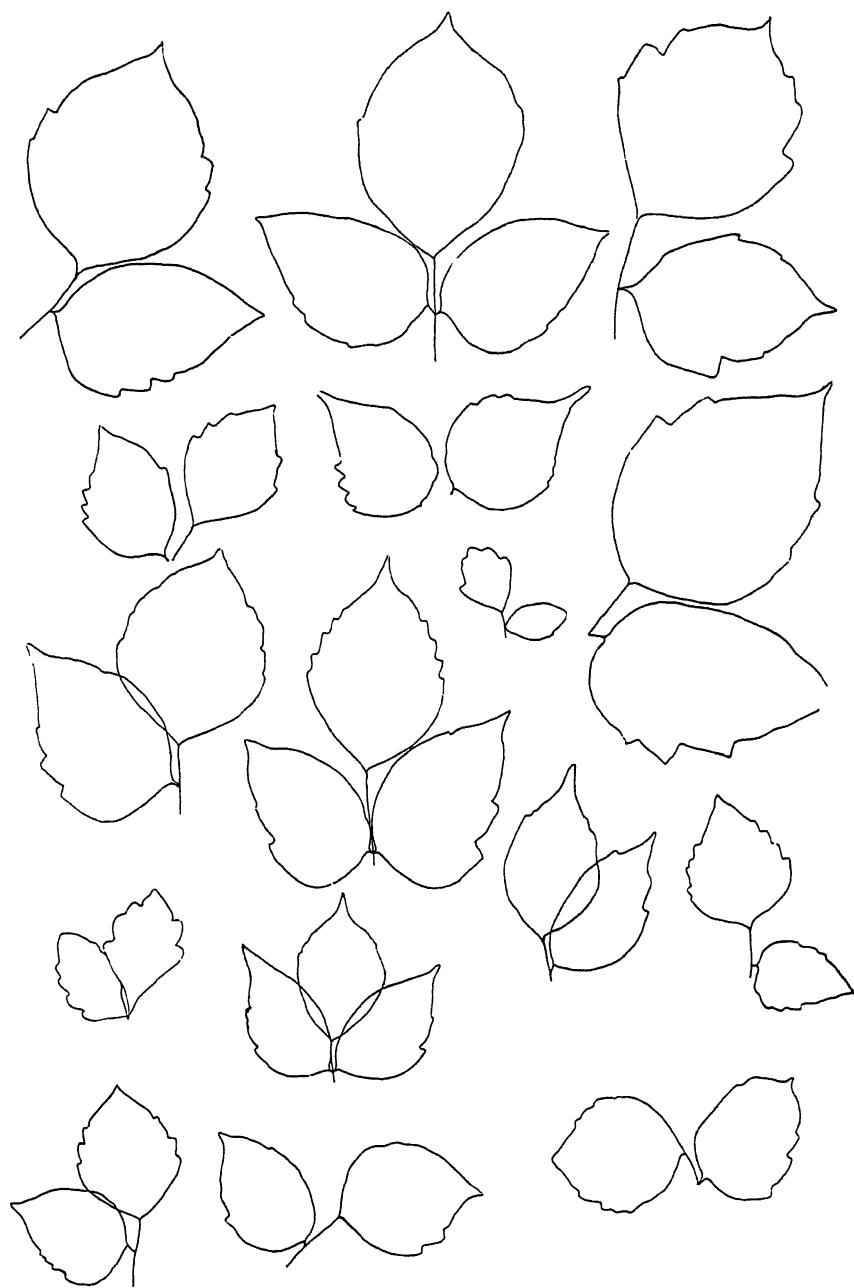
RHUS DIVERSILOBA LEAF TRACINGS ($\times 1$)



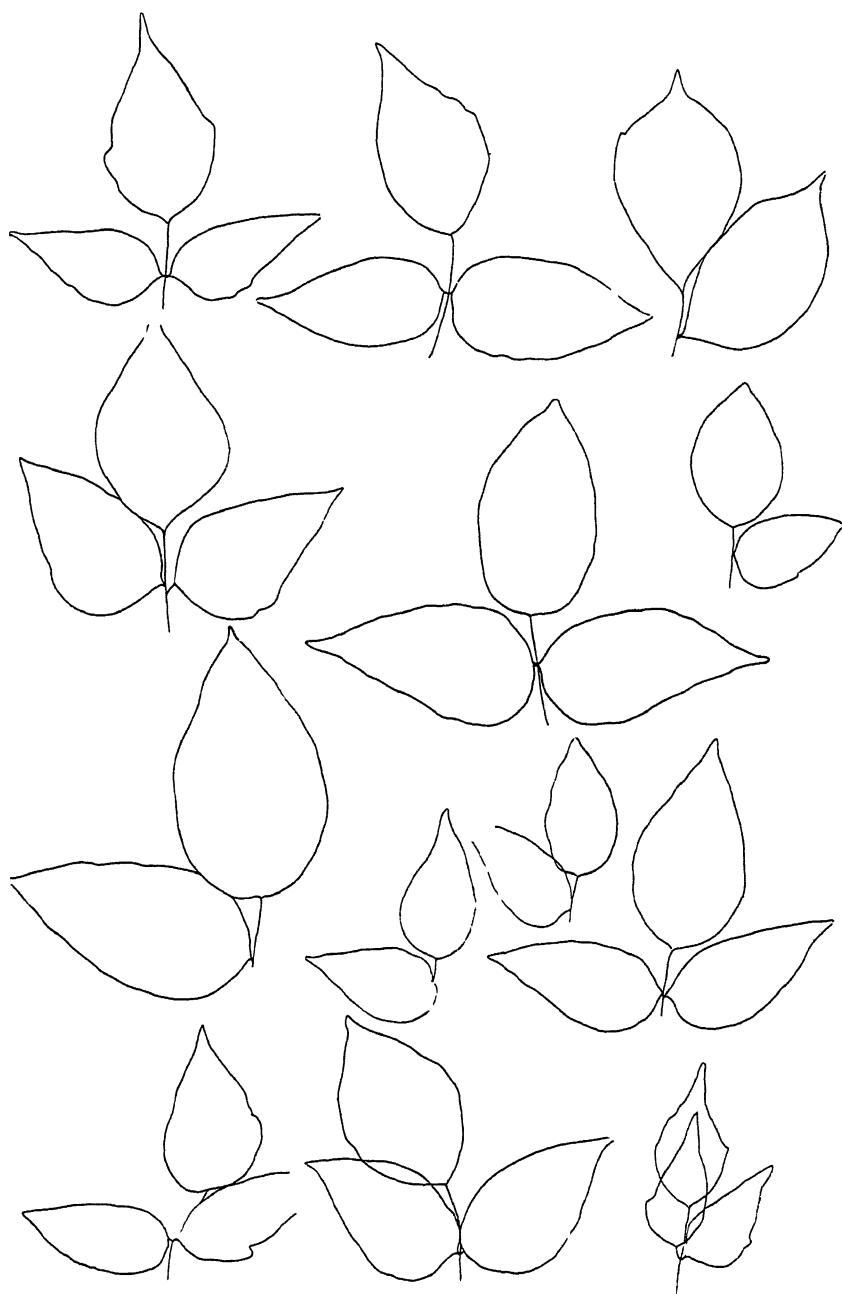
RHUS TOXICODENDRON LEAF TRACINGS ($\times \frac{1}{2}$)



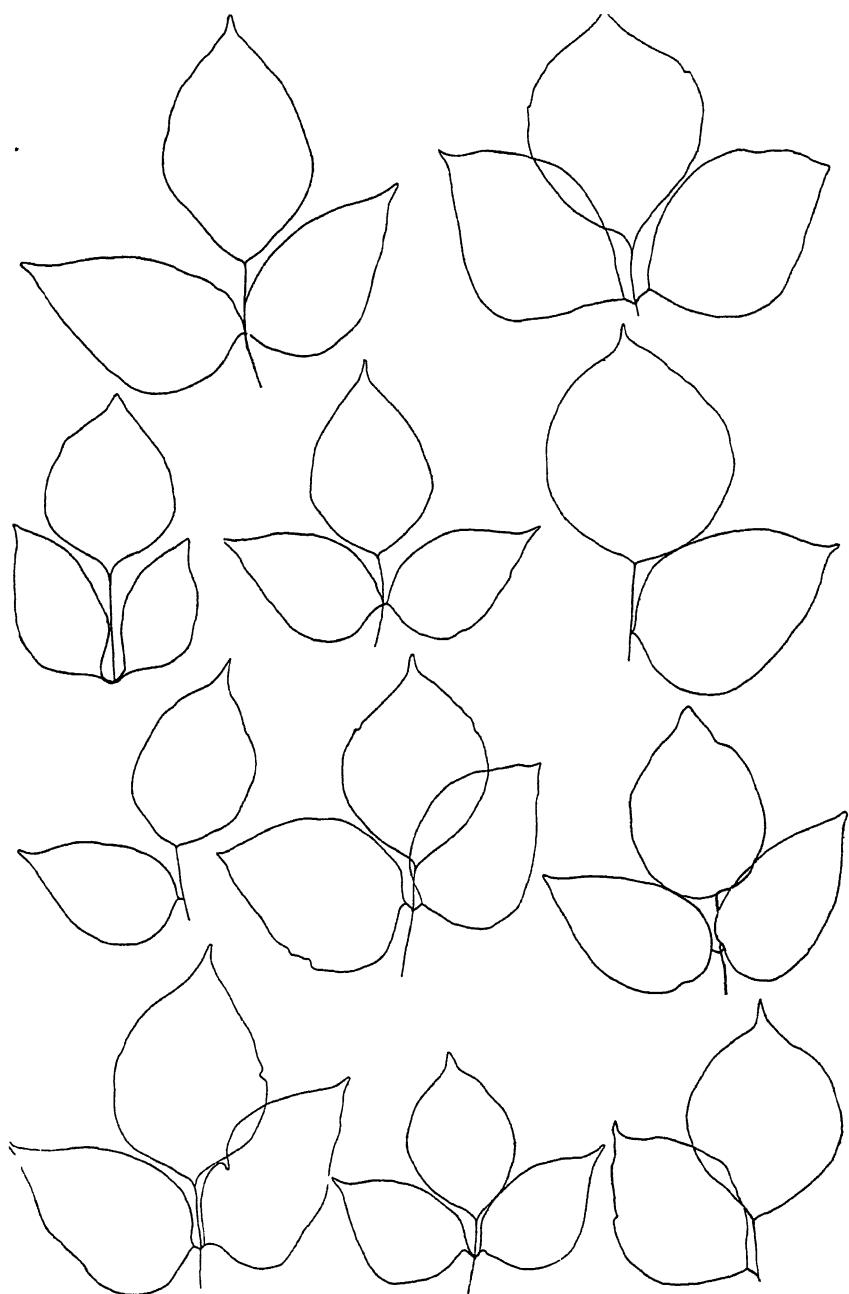
RHUS TOXICODENDRON LEAF TRACINGS ($\times \frac{1}{3}$)



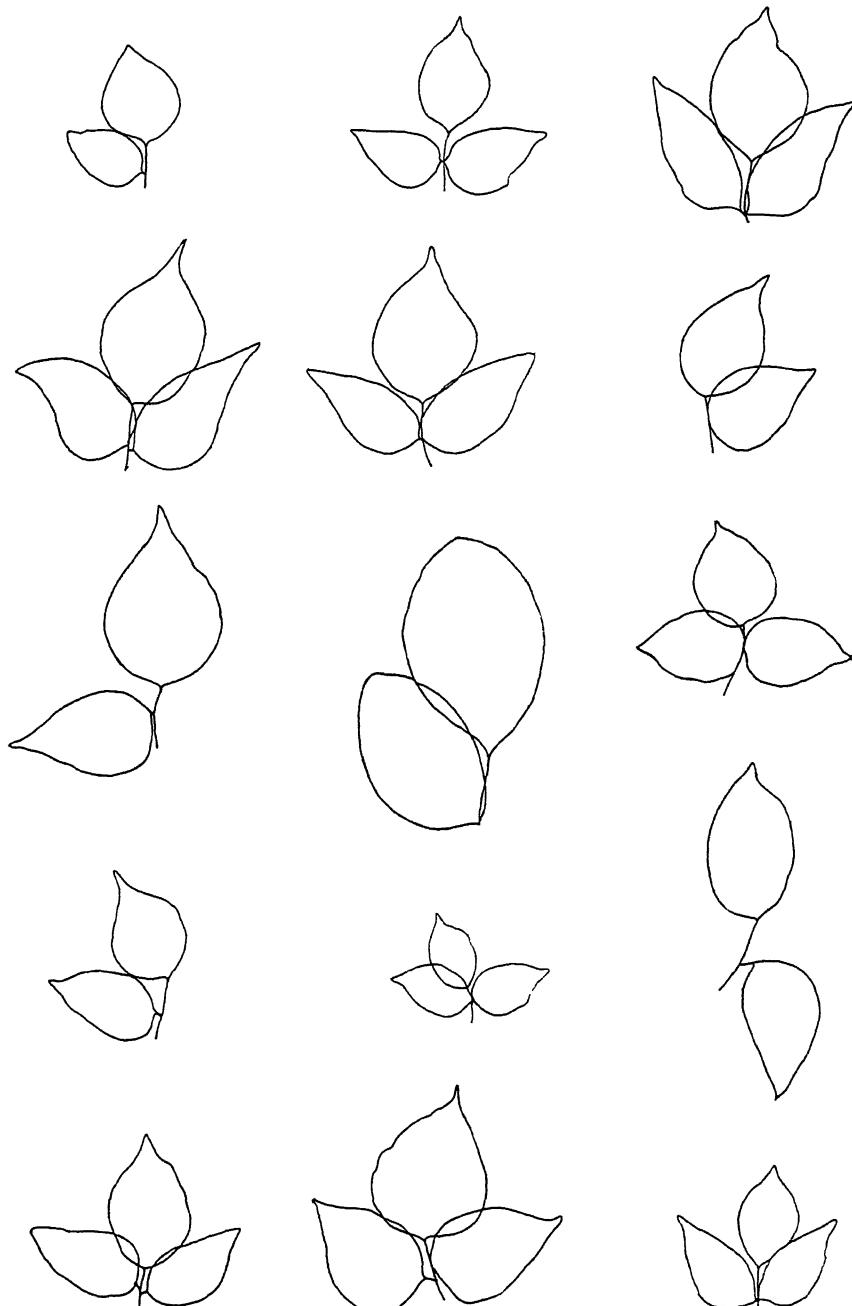
RHUS TOXICODENDRON LEAF TRACINGS ($\times \frac{1}{2}$)



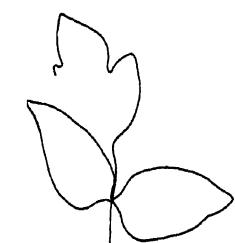
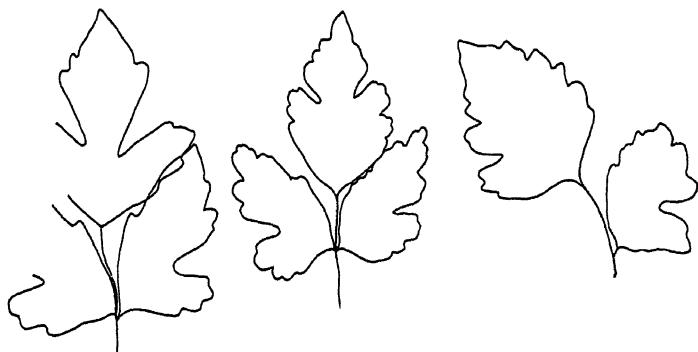
RHUS TOXICODENDRON LEAF TRACINGS ($\times \frac{1}{2}$)



RHUS TOXICODENDRON LEAF TRACINGS ($\times 1$)



RHUS TOXICODENDRON LEAF TRACINGS ($\times 1$)



RHUS TOXICODENDRON VAR EXIMIA (UPPER SIX) LEAF TRACINGS

RHUS DIVARICATA (LOWEST) LEAF TRACING ($\times \frac{1}{2}$)

FIELD MUSEUM OF NATURAL HISTORY

PUBLICATION 229

MUSEUM TECHNIQUE SERIES

No. I

HERBARIUM ORGANIZATION

BY

CHARLES F. MILLSPAUGH

Late Curator, Department of Botany



B. E. DAHLGREN
Acting Curator, Department of Botany

EDITOR

CHICAGO, U. S. A.

June, 1925

HERBARIUM ORGANIZATION

BY C. F. MILLSPAUGH

The organization and maintenance of the herbarium of the Field Museum of Natural History has been under my personal supervision since its incipiency. The system employed in this herbarium, which now contains over a half million sheets, embraces useful practices not common in other herbaria in America or Europe. It has been built up on the premise that each specimen should tell its *whole* story for all time and not be dependent upon the memory of those who form the staff under whose necessarily temporary care it falls.

ACCESSIONS

Immediately upon the receipt of a collection of plants in the herbarium, the recording clerk assigns to the package, or to each package, the next consecutive "accession number" and fills in all the items of which he has information at the time on an *accession blank* (represented in a condensed form in fig. 1) which is filed in the department. For the archives of the Museum, for filing in the Recorder's office together with the correspondence, receipts and other matter pertaining to the acquisition of each accession, an *accession card*, such as shown in fig. 2, is used by all departments of the Museum. The recording clerk then attaches to the packages a *routine ticket* (fig. 3) and stores the packages away to await their turn in mounting.

The mounting preparator selects all the packages of a given accession number and passes the specimens through the poisoning, laying-out, gluing and strapping processes. At the conclusion of each process he enters the date on the routine ticket, appending his initials thereto, and eventually the ticket is turned over to the recording clerk for entry on the department accession blank. Information is thus always at hand to check the work done by each preparator.

When the plants of an accession are mounted, they are passed over to the recording clerk who arranges the sheets in the order of the collector's numbers. (Should the accession be a mixed one, the sheets are first arranged according to collectors and localities under each collector.)

Collector	Locality	Date	Spec.

Fig. 1, Accession Blank (x 2) front and back

Accession Card B No.....	
Date 191	
Field Museum of Natural History Chicago	
<hr/> GIFT, EXCHANGE, PURCHASE, COLLATED, FROM MUSEUM EXPEDITION. <hr/>	
Credit to	
Address	
.....	
Received from	
.....	
By	
Collected by	
Date Collected	
Locality	
<hr/> Description of Objects: <hr/>	
.....	
.....	
Total Number of Specimens Cataloged.....	
<hr/> Catalog Numbers	
Duplicates for Distribution	
Notes.....	
.....	
Signed	
Curator	

Fig. 2 (x 2)

<hr/>	
ACCESSION.....	
<hr/>	
<hr/>	
LABEL	DETERMINE
<hr/>	
DISTRIBUTE	
<hr/>	
ARRANGE	ENTER
<hr/>	
PERF.	STAMP
<hr/>	
MOUNT	STRAP
<hr/>	
POISON	LAY OUT

Fig. 3, Routine Ticket ($\times \frac{3}{4}$)

The recording clerk then enters the sheets in sequence in the current *Herbarium Catalogue*, stamping each sheet with its catalogue number over the herbarium stamp. (Every herbarium should mark its sheets by impressing them with a characteristic ownership stamp.)

THE CATALOGUE

The catalogue volumes are uniform, first class "bookkeeper's ledgers," firmly and flexibly bound. They are "title-backed" with consecutive volume numbers. The page lines are consecutively numbered beginning with 1, in volume 1, and continuing to infinity. Each volume used in this institution contains 625 pages of 40 lines

NAME		Wright, Charles.					
LOCALITY	DATES	FIRST ENTRY		LAST ENTRY		TOTAL SPECIMENS	
		VOL	PAGE	VOL	PAGE		
Bonin Is. (Japan)	1855-56	31	112			1	
China	1853-56	51	477			2	
Colorado		51	477			1	
Cuba	1851-67	4	166	59	202	527	
Kamtschatka	1855-56	51	479			1	
Mexico		40	46			9	
New Mexico	1851-53	2	108	59	202	281	
Nicaragua		40	47	55	47	4	

Fig. 4, Specimen Card from the *Index of Collectors*

each and therefore accommodates 25,000 specimens. Every plant placed in the organized herbarium is catalogued even if it is the only one ever received from a given collector.

When the cataloguing of the plants of an accession is completed, the recording clerk fills the remaining blanks on the accession form, files it away, and turns over the catalogued plants to the keeper-of-the-herbarium. He then selects from the "*Index of Collectors*" the cards of the collectors comprised in the accession and adds to each (fig. 4) the number of newly catalogued specimens, changing the last page record after adding the volume and page of the last previous

ABVCD\EF\GH\IJ\KL\MN\OP\QR\ST\UW\XXZ			
Cuba.			
		Saldio, J. de f.	1
		Sanz & Germann, K. A. 1185	
Underwood, L. M.	13		
Underwood & Cook	4	Wilson, S.	226
Underwood & Cook	4	Wilson & Leon	?
		Hight, S.	527
		Hight & Dawalle	1

entry in the catalogue. Should there have been no previous accession from a collector, a new card is added to the index. He then removes the proper cards from the "*Geographic Index*" and makes the appropriate record thereon (fig. 5.)

The objects achieved by this method of cataloguing are many:

(a) The date of receipt; size and character of a collection; the person or herbarium from which it was received, etc., etc., are now on permanent record.

(b) Should a collection be offered for sale the curator can immediately inform himself as to whether it is needed in the herbarium in his charge or not.

(c) It can be ascertained in a moment, how complete is the representation in the herbarium of any collector's plants, from any locality.

(d) The knowledge may at once be gained of how well any given geographic region is represented.

(e) Idiosyncrasies in label writing and abbreviations that are frequently indecipherable when taken alone become legible in the light of a large series when handled together. These are made plain during the process of cataloguing, and are permanently translated in the records*.

(f) The Index of Collectors forms a source of biographical data concerning individual activities.

(g) Botanists engaged upon special floras find the greatest aid in referring from the geographic index to the catalogue entries pertaining to their field of investigation. Others interested in plants collected in certain regions are referred to all the species in the herbarium from the region of their interest.

(h) Consulting botanists will never need to depend on the working staff of the herbarium for information concerning any particular plant sheet. Everything known concerning each sheet or plant may be learned through the catalogue number stamped on the sheet.

(i) Should a plant number of any collector be referred to in a publication under another name than that of its original label, the specimen can be found readily from its catalogue number.

*The following is an interesting example of this. A package of plants was received in exchange from another herbarium, evidently a cast-off from their excess room. It contained a series of plants plainly of West Indian origin. Most of the collecting sheets bore simply a number. Later one appeared marked "B 38"; another turned up "I. P. 47"; on still another was "J. B. 106"; and finally one was marked "José B. 105." It proved to be the "lost" collection of Don José Blain, made on the Isle of Pines in the 60s., that had been discarded on account of lack of label information.

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CATALOG NO.	COLL. NO.	SPECIES	LOCALITY	DATE OF COLL.	COLLECTED BY	ACC. NO.	SEE ALSO VOL. PAGE
503320		<i>Bidens, melanocarpa; tenuis;</i>	Germany	1907	<i>E. L. Schumann.</i>	2505	
1							59 382
2		<i>Kupferblatt; tenuis.</i>					
3		<i>Leptophylla; G. v. Knobell, g.</i>	Italy	1912	<i>G. Belloncius.</i>		59 383
4		<i>sinuosa; tenuis, minima; Kaus.</i>	Croatia	1909	<i>F. Schult.</i>		52 327
5							59 383
6							
7		<i>multicapitata; tenuis.</i>	Germany	1924	<i>H. Stoy.</i>		
8		<i>sinuosa; L. B. S. Knobell, det.</i>	Croatia	1902	<i>H. Stoy.</i>		56 447
9		<i>Scoparia; tenuis.</i>	Germany	1952	<i>J. Ulrich.</i>		52 401
		<i>lippiana; tenuis.</i>	Croatia	1905	<i>H. Stoy.</i>		
				1903	<i>H. Stoy.</i>		
503320	AET2	<i>Polygonatum multiflorum; Knob.</i>	Colombia	1913	<i>Bar. Schub.-Joseph.</i>	2697	
1	A. 400	<i>Polygonatum</i>		1919			
2	A. 503	<i>Polygonatum</i>		1920			
3		<i>Spleenium, var. L. ex.</i>					551
4	711	<i>Polygonatum lychnoides; (C.) Knob.</i>	Trinidad	1921	<i>L. G. & S. J. Bailey.</i>		
5	T. 12	<i>Polygonoides;</i>					
6	742	<i>Bladium, dentata; L.</i>	Venezuela				
7	876	<i>Nephelaphis</i>					
8		<i>Spiraea latifolia; L.</i>	Germany	1860	<i>F. V. Schulz.</i>		
9	616	<i>Dryopteris filix-mas; Knob.</i>	Germany, Isle.	1907	<i>E. L. Knob.</i>		
503340	237	<i>Asplenium, moniliforme; ex C. Knob.</i>	Trinidad	1899	<i>F. S. Smith & E. L. Knobell, Jr.</i>		
1	232	<i>Polygonatum praeoccidentale; Knob.</i>	Brazil	1915	<i>H. M. Steyermark.</i>	56 447	
2	116	<i>Endemone, elegans;</i>	Colombia	1916			
3	120	<i>polystachys; Knob.</i>					
4	86	<i>Asplenite</i>					
5	120	<i>Endemone, diversifolia; (Knob) Muell.</i>					
6	123	<i>Colinaria</i>					
7		<i>Lycopodium antarcticum;</i>					
8	424	<i>Lycopodium palmatum; (Knob) Knob.</i>	New Jersey	1903	<i>Henry Deering.</i>		
9	425	<i>Smyrnium oligophyllum; (C.) Link.</i>		1906	<i>Philip Swett.</i>		
503350	6264	<i>Bitter flag; (C.) Knob.</i>	New York	1907			
1	6260	<i>Smyrnium olusatrum; (G. Engelm.) Knob.</i>		1905			50 244
2	6261	<i>Bitter flag; Knob.</i>					
3	6262	<i>Smyrnium olusatrum; (Link) Knob.</i>					
4	6267	<i>Bitter flag; Knob.</i>		1909			
5	6262	<i>Smyrnium rotundatum; Knob.</i>		1910			
6	6264	<i>Myrsinaceae; (C.) Knob.</i>					
7	6265	<i>virginica; (C.) f. C. Knob.</i>					
8		<i>Colchicum; variegatum;</i>	Bartsch's	1921	<i>G. L. English.</i>		
9		<i>Dryopteris, Sprangeli.</i>					

HERBARIUM ORGANIZATION—MILLSPAUGH.

II

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COLL. NO.	SPECIES	LOCALITY	DATE OF COLL.	COLLECTED BY	ACC NO.	SEE ALSO VOL PAGE	CATALOG NO.
4957	<i>Distichlis malinellus</i>	Park City	1915	J. C. English.	2497	-	503360
4957	<i>Hippocratea hymenoides</i> (C.) Gray var. <i>forbesii</i>	Michigan	1915	E. S. Gossell.	-	22	1
4957	<i>Distichlis spinulosa</i> (C.) Gray.	"	1917	-	-	-	2
5041	<i>Hippocratea capillaris</i> , var. <i>hirsutissima</i> (G. L.) Gray	"	1918	-	-	-	3
5015	<i>Oligosoma tenuirostre</i> (C.) Schlecht.	"	1920	-	-	-	4
5026	<i>Oligosoma tenuirostre</i> (C.)	"	1921	-	-	-	5
5104	<i>Oligosoma spinulosum</i> , var. <i>intensivum</i> (Wall.) Gray.	"	-	-	-	-	6
5115	- <i>Oligosoma</i> , (C.) Gray.	"	-	-	-	-	7
5115	- <i>spinulosum</i> , var. <i>intensivum</i> (Wall.) Gray.	"	-	-	-	-	8
5123	- - (C.) Gray.	"	-	-	-	-	9
5210	<i>Synaphis</i> <i>Spinosus</i> , Engelm.	Washington	1920	J. C. English.	-	390	503370
5210	<i>Synaphis</i> <i>angustata</i> , Gray.	Oregon	1921	J. C. English.	55	308	1
	- <i>angustata</i> , Gray.	"	-	-	-	-	2
422	<i>Synaphis</i> <i>Engelm.</i> , L.	Germany	1859	Julius Kunkel.	-	569	3
5210	<i>Synaphis</i> <i>Spinosus</i> , (Gray)	Park City	1912	J. C. English.	55	185	4
	- <i>angustata</i> ,	Maryland	1917	E. S. Gossell.	-	481	5
15675	<i>Synaphis</i> <i>angustata</i> , (Gray) Johnson.	Oklahoma	1916	E. S. Gossell.	-	569	6
1036	<i>Synaphis</i> <i>angustata</i> , (Gray) Johnson.	Park City	1918	John Johnson.	57	260	7
157	- <i>angustata</i> , Johnson, & Gray.	Guatemala	1920	J. C. English.	-	371	8
159	<i>Trichomma</i> <i>Fungicola</i> , Gray	"	-	-	-	-	9
2420	<i>Synaphis</i> <i>angustata</i> , (Gray)	Colorado	-	J. M. Johnson.	-	-	503380
2423	<i>Synaphis</i> <i>angustata</i> , (Gray)	"	-	J. M. Johnson.	-	-	1
1143	<i>Synaphis</i> <i>Gosselliae</i> , Engelm.	Idaho	1895	John B. Lindley.	57	226	2
1149	-	"	-	-	-	-	3
1224	<i>Oligosoma constrictum</i> (Gmelin) Gray.	"	-	-	-	-	4
1332	<i>Synaphis</i> <i>Synaphis</i>	"	-	-	-	-	5
1397	<i>Oligosoma constrictum</i> (Gmelin) Gray	"	-	-	-	-	6
160	<i>Synaphis</i> <i>Gosselliae</i> , Gray	Oklahoma	1919	W. R. McCall.	55	581	7
1599	<i>Synaphis</i> <i>Synaphis</i> (E.) Shultz	Maryland	1909	W. R. McCall.	-	369	9
4980	<i>Oligosoma laticulatum</i> , Mc	"	-	-	-	-	503390
	- <i>obsoletum</i> , L.	"	-	-	-	-	-
4455	<i>Oligosoma</i>	"	1920	-	57	227	1
5168	<i>Synaphis</i> <i>Synaphis</i> , (E.) Shultz	New York	1916	-	55	1	2
5220	<i>Synaphis</i> <i>Gosselliae</i> ,	Guatemala	1905	J. C. English, R. Gray.	-	-	3
376	- <i>angustata</i> , Johnson.	California	1921	J. C. English.	55	644	4
3799	- <i>luschütziana</i> , Gray.	"	1920	E. S. Gossell.	-	380	5
1151	- <i>angustata</i> , Johnson.	Washington	1921	J. C. English.	-	553	6
	- <i>angustata</i> , Johnson, R. B.	Oregon	1905	A. L. Palmer.	50	268	7
	<i>Synaphis</i> <i>angustata</i> , Gray.	Oregon	1912	-	55	318	8
	<i>Synaphis</i> <i>angustata</i> .	"	-	-	-	-	9

Specimen Pages (x about $\frac{1}{2}$)

These items and numerous others, constantly occurring as the herbarium grows and is made use of, prove the high value of such a cataloguing system.

In case the name of a species proves to be wrong on the collector's label, or if for any other reason it is changed, the correction is made near the label and the sheet handed to the recording clerk who writes the new designation in the catalogue in pencil, over the old, and returns the sheet to its new cover in the herbarium. The specific position of a sheet in the herbarium is not allowed to be changed by any one other than the recording clerk or herbarium keeper.

When a large private herbarium of mounted specimens is acquired, it is first broken down into the sheets of the various collectors represented therein and afterward catalogued and re-distributed into the organized herbarium as in small accessions. In this manner the following herbaria have been incorporated in that of the Field Museum:

	Acquired	Sheets
Bebb, M. S.....	June 1, 1896	45,962
Chicago, Univ., of ¹	June 25, 1907	44,127
Hall, Elihu ²	Feb. 26, 1916	21,763
Heller, A. A.....	Jan. 9, 1902	13,166
Hitchcock, A. S ³	Mar. 10, 1908	7,089
Millspaugh, C. F.....	Nov. 28, 1896	5,124
Patterson, Harry W.....	Aug. 17, 1900	37,935
Rothrock, J. T.....	July 19, 1909	22,207
Schott, Arthur.....	Mar. 22, 1897	8,494
Schuette, J. H.....	Dec. 22, 1911	10,992
Small, John K.....	July 12, 1904	20,534
Wahlstedt, L. J.....	Mar. 1, 1907	17,556

Every sheet of these herbaria is impressed with a rubber stamp, of distinctive shape, indicating the herbarium to which it originally pertained. It has not been deemed necessary to append the accession number to the sheets as the catalogue number suffices.

HERBARIUM CASES

The most modern and best cases are constructed of steel. These are tightest against dust; will not warp and cause trouble with doors; are at least in part fire-proof; and occupy less floor space in the herbarium. The type used in this herbarium are so constructed as to leave a space

¹Deposited.

²Not yet fully organized.

³His Florida herbarium.

of an inch between the shelf faces and the door and a like space between the back of the shelves and the case back. This serves the purpose of affording ample ventilation and allows the case interior to be more readily cleaned when necessary.

The blocks of cases are arranged in wings endwise to the side walls. The pigeon holes are spaced 5 inches and are 12 inches wide by 17 inches deep. The cases are 14 pigeon holes high and have two tiers to the door. There are two half doors to each case front. The cases are built back-to-back into a unit, the pigeon holes being separated from each other at the back by longitudinal strips of steel, one inch wide, and a space of an inch is left between the pigeon hole backs. The plans were drawn and the first few cases built when poisoning by carbon bisulphide was thought to be efficient*; hence the thorough ventilation, which is perhaps a good feature still as the cases are very readily cleaned with the vacuum brush.

The case units are set together in blocks of four. Each door is provided with a metal label-holder to carry a 5 x 8-inch card upon which is a printed indication of the contents of the section behind the door.

SLIDES: Each pigeon hole is converted into a drawer by placing beneath its contents a straw-board slide upon the front of which is hinged, with black muslin, a one-inch drop. This drop is of great utility: it serves as a "pull" by which the plants are brought forward, thus doing away with the old method of grasping the covers with both hands—a destructive process injuring the plants and the covers as well; it also serves an excellent purpose in affording a place to which subdivisional labels may be attached. As the muslin hinge is very loose the drop in no way interferes with the withdrawal of the contents of the pigeon hole next beneath. These slides are manufactured by a paper box firm and cost about twenty dollars per thousand.

HERBARIUM ARRANGEMENT

The families, the genera and the species are arranged alphabetically in this herbarium. The alphabetic arrangement saves everyone connected with the herbarium, or using it, much valuable time. This disposition of genera and of species is open to objection, yet in a large and rapidly growing herbarium it has many important points in its favor—mostly, in saving time. It does away with cumbrous index cards to genera and species which, if kept up to date, require changing with

*All herbarium specimens are now poisoned with corrosive sublimate which affords permanent protection.

the issue of each new monograph; it assists materially in keeping the species in their proper position in the pigeon holes; it saves a vast amount of time in the insertion of new material, and relieves the scientific staff of the mechanical duty of distributing new material.

In this herbarium the species under all genera are kept in individual "species covers" with the name plainly written, or hand-printed in ink at the lower left hand margin near the fold. To this the most important synonym is added when necessary for cross-reference in the genus. The species covers are of "tough check" manila, calendered to a smooth surface, and are of several contrasting colors to distinguish large geographic divisions. The colors used are as follows: North America—buff; Mexico and Central America—red; West Indies—olive; South America—salmon; Europe—green; Asia—purple; Africa—blue; Oceanica—yellow.

HERBARIUM RULES

"When consulting specimens in this herbarium, pull out the slide of the pigeon hole a few inches. On finding the species cover desired push back all the covers above it before withdrawing it. The place for its return is then plainly indicated.

Should a plant be found to be wrongly determined please write your correction neatly, near the label, and append your name or initials. Do not return the sheet to the herbarium, leave it out for the Recorder to replace.

Please do not write upon, or otherwise deface, the original label of any sheet. Annoting the sheet itself is, however, invited."

LOANS

Specimens are loaned to institutions freely but only to individuals accredited by institutions which will guarantee the protection of the material and insure its prompt return.

When a request for a loan of specimens is received by the Director and approved by him on the recommendation of the department, the specimens are taken from the herbarium and a list of their catalogue numbers is made, in order to identify missing specimens in case of error at the time they are returned. The list is attached to a numbered *memo* (fig. 7), which also bears the name of the institution or individual to whom the loan is issued, the date of forwarding and the number of specimens sent. This memo is kept on file in the department. A second memo (fig. 8), bearing the same number and corresponding data, is prepared for the Recorder of the Museum. A permit (fig. 9) to remove the specimens from the Museum is then issued by

Year

Memo. No.

Field Museum of Natural History
DEPARTMENT OF BOTANY

SPECIMENS SENT TO OR RECEIVED FROM:

For Purpose of

Sent by Date

Received by Date

Returned by Date

Stored in

MEMORANDUM OF SPECIMENS

Fig. 7 (x ½)

MEMO. No.....
Department.....
Field Museum of Natural History
<hr/>
From
To
Address
<hr/>
<hr/>
FOR EXAMINATION, FOR DETERMINATION, EXCHANGE
From Collection of.....
..... Original Accession Number
<hr/>
Description of Objects:
<hr/>
<hr/>
<hr/>
Date received
Signature.....
Date forwarded.....
Signature
<hr/>
Accession No..... Transportation No.....
<hr/>
Remarks.....
<hr/>
<hr/>

Fig. 8 ($\times \frac{2}{3}$)

FIELD MUSEUM OF NATURAL HISTORY
CHICAGO

Mr. D. C. DAVIES, Director,

Dear Sir:

Permission is requested to

to

.....

by , charges specimens
of

.....

Memo. B. No.

Approved:

.....
Director

Respectfully yours,

Curator, Dept. Botany

the Director, after which they may be dispatched. When the loan is returned, the record on these memos is completed by checking off the numbers on the department memo, and entering the date of return on both. All correspondence relating to the loan is attached to the memo sent to the office of the Museum Recorder.

In the case of specimens borrowed by the department, a similar procedure is followed. A letter is sent to the Director asking him to request the loan. As soon as the specimens are received, two memos are made out, one for the department files, and one for the Museum Recorder. Both state the number of specimens received, their source and the date of receipt. When study upon them is finished, a permit for their return is issued by the Director, and the memos are completed by adding the date of return. As in the case of outgoing loans, all correspondence pertaining to the transaction is attached to the memo sent to the Recorder's office.

FIELD MUSEUM OF NATURAL HISTORY

PUBLICATION 231

BOTANICAL SERIES

VOL. IV, No. 4

SOUTH AMERICAN PLANTS

BY

J. FRANCIS MACBRIDE

Assistant Curator, Taxonomy

also

new Euphorbias by C. F. Millspaugh and Canavalias by C. V. Piper

B. E. DAHLGREN

Acting Curator, Department of Botany

EDITOR



CHICAGO, U. S. A.

June 29, 1925

SOUTH AMERICAN PLANTS

mostly from the

CAPTAIN MARSHALL FIELD EXPEDITION TO PERU

1922 AND 1923

BY

J. FRANCIS MACBRIDE

also

new Euphorbias by C. F. Millspaugh and Canavalias by C. V. Piper

This is the first Museum publication based upon the collections of the two Captain Marshall Field Botanical Expeditions but many important papers on them have been presented elsewhere by specialists who have studied a number of the larger groups. The results of their work have disclosed an amazing number of herbs and trees hitherto unknown to science, indicating the great opportunity for further botanical exploration in Peru. The 1924 Annual Report of the Director of this institution lists the botanists who have assumed responsibility for certain groups and the Reports for 1922 and 1923 give the itineraries for both trips. However, a complete list of the collecting stations has not been published, and therefore one is appended.

As a traveler and collector in Peru, one becomes largely dependent for comfort and aid on the good-will of the inhabitants. The work is constantly complicated by problems concerning transportation and food both for men and cargo animals. Indeed, the extent and seriousness of these problems in their relation to botanical collecting can scarcely be believed until experienced. Therefore, such success as attended the two Captain Marshall Field Expeditions was largely due to the generous personal interest taken in our work by many residents and natives of Peru. It was possible to mention only a few of these in the Reports referred to above and accordingly I wish to express here my grateful appreciation to all those who aided us so materially.

I am indebted to Dr. B. E. Dahlgren for many helpful suggestions in the preparation of the paper.

COLLECTING LOCALITIES IN PERU FOR THE CAPTAIN MARSHALL FIELD
BOTANICAL EXPEDITIONS, 1922 and 1923

DEPARTMENT OF ANCASH

Catuc (near Huaraz)
Chacchan
Huarapasca (E. Ancash)
Huaraz
Pomopampa (E. Ancash)
Recuay
Tambo de Pariocota
Yautan

DEPARTMENT OF HUANUCO

Ambo
Cani (near Mito)
Chaglla
Chasqui (near Mito)
Chavanillo
Chinchapalca (near Mito)
Cueva Grande (near Pozuzo)
Cushi
Huacachi (near Muña)
Huanuco
Llata
Maria Del Valle
Mito
Muña
Pampayacu (Rio Chinchao)
Panao
Piedra Grande (near Muña)
Playapampa (S.E. Huanuco)
Pozuzo
Punco
Rio Huallaga Cañon (below Muña)
Rio Marañon (below Chavanillo)
San Carlos Mines (near Huallanca)

Tambillo (near Panao)

Tambo de Vaca
Tomaiquichua
Vilcabamba (Rio Chinchao)
Yanahuanca
Yanano
Yanashallas (W. Huanuco)

DEPARTMENT OF JUNIN

Cabello (N. Junin)
Cerro de Pasco
Chinche (near Yanahuanca)
Huacapistana
Huancayo
Huariaca
Huaron (N. Junin)
Huertas (N. Junin)
La Merced
La Oroya
La Quinua
Morococha
San José (N. Junin)
San Rafael
Tarma
Uspachaca
Yauli

DEPARTMENT OF LIMA

Callao
Casapalca
Chosica
Lima
Matucana
Rio Blanco
Viso

Hesperomeles Fieldii, spec. nov., arbor usque ad 3.5 m. alta, inermis; ramulis foliisque glabris; internodiis 0.5-1 cm. longis; foliorum petiolo 3-10 mm. longo, lamina coriaceo-chartacea elliptica vel obovata 2 (1.5) -4 (4.5) cm. longa 1.5 (1)-2.5 (3) cm. lata basi subabrupte acuta vel in petiolum leviter contracta apice rotundata vel fere truncata subtus ut videtur pallidiore supra nitente margine a medio ad apicem minute crenato-dentata, venulis inconspicuis, costa media mediocriter prominente; inflorescentiis cymoso-corymbosis fere glabris laxiusculis folios distincte superantibus; pedicellis bracteisque (linearibus) glabris vel parce villosculis; calycis lobis late ovatis acutis vix 1 mm. longis quam receptacula distincte brevioribus; floribus ut videtur albis 5-7 mm. latis, petalis denticulatis glabris, disco villoso; fructibus ignotis.—PERU: 10 ft. much branched tree of steep open slopes, Yanano, May 13-16, 1923, *Macbride* 3752 (TYPE, Field Museum).

This attractive flowering tree—resembling considerably our common Hawthorn—is named for Capt. Marshall Field, sponsor of the expedition upon which it was secured.

Both Schneider, Engl. Bot. Jahrb. xlii. 85-88 (1908), and Pittier, Contrib. U. S. Nat. Herb. xx. 106-111 (1918), proposing new species of this rosaceous group, comment upon our meager and inexact knowledge of many of the earlier described forms. A most cursory examination of the literature relating to the group will confirm their observation as will also any attempt, however superficial, to determine herbarium material. Notwithstanding this difficulty, however, it seems necessary to propose the tree described above as a new species because of its large and quite glabrous leaves and its singularly short and broad calyx-lobes.

The validity of *Hesperomeles* Lindl. Bot. Reg. xxiii. sub. t. 1956 (1837), has often been questioned. Bentham and Hooker, Gen. Pl. I. 629 (1865), wrote "ab *Osteomele* nullo modo differt, nisi foliis simplicibus" and so merged it with the earlier published genus *Osteomeles* Lindl. Trans. Linn. Soc. xiii. 98. t. 8 (1821). In this they were followed by Decaisne in his Mémoire sur la famille des Pomacées, Nouv. Archives du Mus. d'Hist. Nat. Paris, x. 184 (1874). And recently Pittier, l.c., without comment, has also accepted its reduction.

Schneider, l.c., however, maintained the genus although he advanced no newly discovered character. Evidently it can be distinguished in the herbarium from *Osteomeles* only by the simple leaves and, as Decaisne points out, this character, in the Rosaceae, may not be of much importance. But it is doubtful if he knew the peculiar habit of *O. anthylidifolia* (Sm.) Lindl. the single typical (and original) species. It is thus described by Rock, Indig. Trees Hawaii. Isl. 46 (1913): "a rosaceous vine of great toughness forms dense tangles over thrown up fissures in pahoehoe lava. During the morning sunshine thousands of

Odynerus (Hawaiian wasps) and bees can be found flying over the sweet-scented flowers The Hawaiian *Osteomeles*, therefore, appears to be altogether distinctive in habit, and, because of its pinnate leaves, also in aspect from the simple-leaved trees and shrubs of the Andes that have been considered congeneric. Consequently Schneider's restoration of the generic name *Hesperomeles* for the latter is advisable.

HESPEROMELES PERNETTYOIDES Wedd. *Chlor. And.* ii. 230 (1857).—
PERU: 4 ft. and less high, Yanahuanca, June 16-22, 1922, *Macbride & Featherstone* 1286; dryish canyon slope, Chinchapalca, pueblo 5 miles above Mito, July 16-27, 1922, *Macbride & Featherstone* 1590; low (2-3 ft.) shrub of grasslands and dry canyons, Mito, July 8-22, 1922, *Macbride & Featherstone* 1507; ditch bank, to 14 ft., branches spreading, virgate, Tomaiquichua, pueblo 3 miles below Ambo, Sept. 19, 1922, *Macbride & Featherstone* 2418.

The petals of this species are white although the anthers are red. Number 2418 was collected as a luxuriant example of this common plant, its greater size and vigor being ascribed to the proximity of an irrigation ditch. Very probably this shrub—met with so frequently in the central Peruvian Andes and known to the Indians as “Muchci”—is variable enough in habit and in degree of leaf-dentation to include the subdecumbent form described under the name *H. cuneata* Lindl. *Bot. Reg. xxiii. sub. t. 1956 (1837)*. However, as observed by Schneider, l.c. 87, the problem ought to await further field and herbarium study.

HESPEROMELES OBLONGA Lindl. *Bot. Reg. xxiii. sub. t. 1956 (1837)*.—
PERU: rocky eastern canyon side, to 3 ft. high, Llata, Aug. 21, 1922, *Macbride & Featherstone* 2267.

This shrub, curiously enough not mentioned by Decaisne in his revision, l.c., can scarcely be the same as *H. ferruginosa* (Pers.) Benth. as suggested by Schneider, l.c. 86. Its leaves are not at all cordate but truly oblong (4-6 cm. long by 2-2.5 cm. broad), and abruptly rounded to the subacute base and apex.

Psoralea maleolens, spec. nov., fruticosa circa 1.5 m. alta; ramis ramiculisque plerumque glabris sed glanduliferis, glandulis sessilibus; ramulis in siccitate saepe purpurascensibus subherbaceis gracillimis patenti-adscendentibus et flexuosis vel curvatis glabris vel parti superiori minute et parce adpresso nigro-strigillosis; foliis nigro-punctatis viridis subtilibus paulo pallidioribus; stipulis ovatis striatis glandulosis et nigro-ciliatis circa 3 mm. longis; petiolo 1.5-2.5 cm. longo glabro vel paulo adpresso strigilloso; foliolis subsessilibus lanceolatis vel ovato-lanceolatis basi apiceque subacutis vel apice abrupte apiculatis circa 3-5 cm. longis et 1.2 cm. latis (2.5-5.5 cm. X 1-1.5 cm.) glabris, petiolatis vulgo hirsuto-villosis; spicis densis vel fructiferis solum mediocriter re-

motifloris circa 4 cm. longis dense nigro-villosis, pedunculis plerumque 2.5-4 cm. longis glabris vel paullo adpresso strigilosis; floribus saepe plus minusve fasciculatis; bracteis ovato- vel rotundato-acutis circa 2 mm. longis; calycibus mediocriter glandulosis et villosis cum pilis subpatentibus, tubo fere 3 mm. longo; laciniis circa 2 mm. longis superioribus anguste ovatis inferioribus ovatis profunde dentatis; corolla 6 vel 7 mm. longa purpurea.—PERU: Mito, July 8-22, 1922, Macbride & Featherstone 1376 (TYPE, Field Museum); open brushy canyon side, 15 miles N.E. of Huanuco, June 12-22, 1922, Macbride & Featherstone 2146; sunny grassy slopes, Panao, May 10, 1923, Macbride 4946.

This species apparently is most nearly related to *P. mexicana* (L.f.) Vail, Bull. Bot. Club, xxi. 119 (1894), to which Colombian plant, however, it can scarcely be referred. It lacks entirely the spreading coarse pubescence that thickly clothes the branchlets and, to some extent, the leaves of *P. mexicana*; and its leaves are narrower and its stems slenderer. Whatever pubescence is present is a subappressed strigilosity very different in character from that of *P. mexicana*, and therefore not to be regarded as the same reduced in quantity.

P. maleolens in pubescence and leaf-form suggests *P. glandulosa* L. Sp. Pl. ed. 2. 1075 (1763), but lacks the elevated glands and large pale flowers of that Chilean species. *P. lutea* Molina, Sagg. Chile, 163 (1782) and ed. 2. 145, 293 (1810) credited by Poiret, Lam. Encyc. v. 685 (1804) to Peru or Chili is almost surely a mere color variation or freak of *P. glandulosa* as indicated by Gay, Hist. Chile, ii. 87 (1846) and by Reiche, Fl. Chile, ii. 76 (1897) since Molina himself in the second edition of his work, i.c., added to his previous descriptive account of it (and I think significantly) the following sentence: “Io non vidi che due o tre piante de questa specie, o piuttosto varietà”, and moreover omitted it entirely from his chapter of botanical diagnoses.

My field notes record *P. maleolens* as a 4-5 ft. half-shrub or shrub rather open in habit, with a very disagreeable odor, even more unpleasant than that of *P. lasiostachys* Vog. Nov. Act. xix. Suppl. 1. 13 (1843) to which species Macbride & Featherstone 1375, found growing near by, seems referable. The Indians called any species of this alliance “Culin” or “Coling” but distinguished their medicinal properties, using, for instance, *P. lasiostachys* under the name “Coling Macho” only for an ailment of the stomach and *P. maleolens*, under the name “Coling Imbra” as a substitute for tea as well as a remedy for disorders of the stomach.

PSORALEA MARGINATA Meyen, Reise, i. 436 (1834).—PERU: moist flats, Tomaiquichua, pueblo 3 miles below Ambo, Sept. 19, 1922, Macbride & Featherstone 2436, sunny canyon slope, Yanano, May 13-16, 1923, Macbride 3736.

This 3-4 ft. shrub or small tree with a crown of short branchlets and blue or purple flowers appears from description to be the same as Meyen's plant secured by him on the Rio de Arica in extreme southern Peru.

PSORALEA PUBESCENS Pers. Syn. Pl. ii. 347 (1807).—PERU: moist soils of Santa Eulalia river-valley, Chosica, April 28-May 2, 1922, *Macbride & Featherstone* 500.

This is a shrub only about three feet high, the stems strict to the inflorescence and growing in clumps, the flowers blue and the upper portions of the stems very white-villous. It is either the same as Persoon's plant—very meagerly described—or a new species.

Psoralea munyensis, spec. nov., fruticosa erecta fere 2 m. alta; ramulis petiolis pedunculisque gracilis plus minusve griseis vel nigro-griseis cum pilis brevibus crispis vel firmiusculis patentibus; stipulis anguste lanceolatis acuminatis circa 5 mm. longis adpresso pilosis; petiolo communi (2) 3.5-5.5 cm. longo; foliolis ovato-lanceolatis basi vix acutis apice mediocriter abrupte acuminatis plerumque 2-3 cm. latis 5-8 cm. longis paullo vel vix glandulo-punctatis supra viridibus glabris vel costa venisque obscure strigilosis subtus paullo pallidioribus subadpresso pilosiusculis vel denique subglabris, juvenile sericeo-pilosus; racemis elongatis mediocriter compactis vel basi plus minusve interrupitis circa 7 cm. longis folio 2-3-pllo longioribus; pedunculis 6-9 cm. longis; pedicellis 1-2 mm. longis nigro-strigosis; bracteis ovatis abrupte longo-acuminatis 6-7 mm. longis; calycis haud vel obscure glandulosis dense subadpresso villosis cum pilis nigris et albis intermixtis; tubo circa 2 mm. longo; lacinias linearis-lanceolatis vel anguste ovatis acuminatis circa 2 mm. longis; calycis fructiferi lacinias similibus sed 3 vel fere 4 mm. longis; corolla ut videtur purpurea 4-5 mm. longa; legumina obliqua circa 5 mm. longa et 2 mm. lata subglabra abrupte apiculata.—PERU: slender shrub (5 ft.) at edge of montaña along trail, Muña, May 23-June 4, 1923, *Macbride* 3906 (TYPE, Field Museum).

P. munyensis is distinctive among the pubescent-leaved species with elongate flowering stalks because of its very small flowers. Its leaves may become nearly glabrous with age but among the glabrous-leaved species it can be compared only with *P. yurensis* Rusby, Bull. N. Y. Bot. Gard. vi. 511 (1910), which, however, is described as having very small (2 mm. long) stipules, longer corollas and an ovoid acuminate pod.

Psoralea Featherstonei, spec. nov., fruticosa circa 2 m. alta; ramis brunneis mediocriter robustis simplicibus; ramulis petiolis pedunculisque molliter cum pilis patentibus pilosis etiam adpresso nigro-strigilosis; stipulis a basi deltoidea acutis 2-3 mm. longis dense adpresso strigosis; petiolo communi vulgo 4 cm. longo; foliolis breve petiolatis (circa 3 mm. longis) oblongo-lanceolatis basi apiceque subacutis vel obtusis

plerumque circa 6 cm. longis et 2 cm. latis aequabiliter utrinque pallido-viridibus glabris vel costa media paullulo strigillosa, brunneo-glandulo-punctatis; pedunculis 9-12 cm. longis saepe cum 2 flores in medio parti; racemis congestis circa 4.5 cm. longis et 2 cm. latis; floribus subsessilis purpureis circa 1 cm. longis; calycibus molliter cum pilis nigris et albis adpressis intermixtis pilosis circa 6 mm. longis; laciniis ovatis vix acutis circa 1 mm. longis; bracteis rotundis abrupte acutis circa 5 mm. longis.—PERU: steep shrubby western slope, Matucana, April 12-May 3, 1922, Macbride & Featherstone 406 (TYPE, Field Museum).

This beautiful shrub with virgate branches and purple-blue flowers probably is most nearly related to *P. pubescens* from which it may be distinguished readily by its oblongish blunt leaves that are essentially glabrous.

Psoralea potens, spec. nov., fruticosa robusta foetida 2 m. alta; caulis aliquot ad basim 7.5 cm. in diametro; ramulis petiolis pedunculisque plus minusve cum pilis nigris et albis pulverulo-puberulis et crisper strigillosis etiam sparsae glandulosis cum glandulis paullulo elevatis; stipulis late ovatis acutis vel breve acuminatis 2-3 mm. longis; petiolo communi 4-5 cm. longo; foliolis anguste ovato-lanceolatis basi subacutis apice breve acuminatis 5-6 cm. longis 1.5-2 cm. latis aequabiliter utrinque pallido-viridibus glabris excepto costa media adpresso strigillosa, dense nigro-glandulo-punctatis; pedunculus elongatis plus minusve nigriscentibus 9-14 cm. longis; racemis mediocriter densis vel parti inferiori remotifloris; calyce circa 8 mm. longo dense cum pilis nigris et albis et cum glandulis stipitatis intermixtis villosi-hirsuto; laciniis ovatis acutis non superante 2 mm. longis; floribus ut videtur purpureis circa 1 cm. longis.—PERU: several-stemmed clumps on southwest slope, Tarma, June 1-6, 1922, Macbride & Featherstone 1022 (TYPE, Field Museum).

P. potens, the name given in reference to the strong vile odor of the plant, and the other species described or discussed above may be summarized as follows. All the species ascribed to Peru are included in the key with the exception of *P. divaricata* Willd. Enum. ii. 788 (1809), which is only doubtfully referred to this genus by HBK. Nov. Gen. & Sp. vi. 489 (1823) who describe the corolla as two times longer than the calyx.

KEY TO THE PSORALIAS OF PERU

Branches and branchlets glabrous or sparsely appressed strigillose.

Flowers 8-10 mm. long; glands more or less elevated.

 Calyx sparsely appressed strigose. *P. glandulosa*.

 Calyx densely villous and glandular. *P. potens*.

Flowers 6-7 mm. long; glands sessile. *P. maleolens*.

Branches and branchlets villous, pilose or gray-puberulent.

Pubescence of branchlets spreading, villous-hirsute; flowers

 small, about 6 mm. long. *P. mexicana*.

Pubescence of branchlets various, if spreading, not at all

 hirsute; flowers often longer.

Leaflets strongly pubescent beneath, at least on the
 veins.

Spikes subequaling or shorter than the leaves.	
Very dense; flowers about 6 mm. long . . .	<i>P. marginata</i> .
More or less interrupted; flowers larger. . .	<i>P. pubescens</i> .
Spikes or racemes much exceeding the leaves.	
Leaflets tomentose beneath.	<i>P. Trianae</i> .
Leaflets not tomentose beneath.	
More or less appressed silky; flow-	
ers about 6 mm. long	<i>P. munyensis</i> .
More or less hirsute-villous; flowers	
longer.	<i>P. pubescens</i> .
Leaflets glabrous or essentially so.	
Calyx glands sessile, more or less hidden by	
pubescence.	
Spikes much exceeding the leaves.	
Branchlets "viscid-pubescent"	<i>P. lasiostachys</i> .
Branchlets "gray-puberulent or	
white-pilose"	<i>P. yurensis</i> .
Spikes little, if any, longer than the leaves	<i>P. Featherstonei</i> .
Calyx glands stipitate, conspicuous.	
Branchlets densely villous	<i>P. lasiostachys</i> .
Branchlets closely pubescent with a fine	
appressed indument.	<i>P. potens</i> .

In Contrib. Gray Herb. lxxv. 14 (1922) I questioned the expediency of segregating the genus *Psoralea* as proposed by Rydberg, N. A. Fl. xxiv. (1919). I am still unsatisfied that the salient characters upon which he bases his segregation,—viz., the adherency or inadherency of the pericarp to the seed and the indehiscence or ultimate dehiscence of the pod—are here of sufficient significance to warrant their use for the delimitation of various genera. These characters seem not to be developed to an equal state of definiteness when all the species are considered but, as a matter of fact, many forms are as yet very imperfectly known. For the present, then, it seems to me,—with due recognition of Dr. Rydberg's sincerity and with appreciation of his conception of genera,—that the continued acceptance of *Psoralea* in the larger sense is most natural and feasible.

Parosela ayavacensis (HBK.) comb. nov. *Dalea ayavacensis* HBK. Nov. Gen. & Sp. vi. 486 (1823).—PERU: Dept. Ayacucho, Weberbauer 5570; Tambillo, near Panao, Macbride 3576; Tomaiquichua, near Ambo, Macbride & Featherstone 2427; 15 miles s.e. of Huanuco, Macbride & Featherstone 2085.

This is an open-growing shrub, usually 4 or 5 feet high, of stream banks or sunny thickets. The flowers are bright or deep blue with two greenish spots on the center of the banner.

TEPHROSIA TOXICARIA (Sw.) Pers. Syn. Pl. ii. 329 (1807).—PERU: La Merced, Hacienda Schunke, Aug. 27-Sept. 1, 1923, Macbride 5661.

Although Weberbauer* does not list this widely distributed species,

*The use of Dr. Weberbauer's name here as elsewhere in this paper refers to his excellent Die Pflanzenwelt der Peruanischen Anden, Die Veg. der Erde, XII. (1911).

I found it well known to the Indians in the vicinity of La Merced who use it to stupify fish. The flowers have been described as "whitish" or "pale yellow" but those of the specimen cited above were white except for the banner which was green without and white-edged.

Tephrosia diversifolia (Rose) comb. nov. *Cracca diversifolia* Rose, Contrib. U. S. Nat. Herb. xii. 270 (1909).

Tephrosia cuernavacana (Rose) comb. nov. *Cracca cuernavacana* Rose, Contrib. U. S. Nat. Herb. xii. 269 (1909).

Tephrosia Pringlei (Rose) comb. nov. *Cracca Pringlei* Rose, Bot. Gaz. xl. 143 (1905).

Tephrosia Watsoniana (Standl.) comb. nov. *Cracca Watsoniana* Standl. Contrib. U. S. Nat. Herb. xxiii. 472 (1922). *Clitoria(?) sericea* S. Wats. Proc. Am. Acad. xxii. 407 (1887), not *Tephrosia sericea* Baker, in Oliver, Fl. Trop. Afr. ii. 107 (1871), a valid species.

TEPHROSIA LANATA Mart. & Gal., var. **velutina** (Rydb.) comb. nov. *Cracca velutina* Rydb. N. A. Fl. xxiv. 171 (1923).—MEXICO: Zopelote, Tepic, 1895, F. H. Lamb 575.

This is probably a fairly well-marked variety by virtue of its somewhat denser and shorter pubescence and mostly oblongish leaflets. The other differences noted by Rydberg, l.c., notably the larger flowers and the merely terminal racemes, are not apparent or pronounced in the specimen before me.

APURIMACIA MICHELII (Rusby) Harms, Rep. Spec. Nov. xix. 10 (1923). *Gliricidia Michelii* Rusby, Mem. Torr. Bot. Club, vi. 22 (1896).—PERU: In rocks along river. Woody below; long stems (4 ft.) rather "viny". Flowers dull bluish, the bases green. Huariaca, Sept. 13, 1922, Macbride & Featherstone 2403; open shrub to 5 ft. high. River canyon, Uspachaca, June 23, 1922, Macbride & Featherstone 1293; open shrub-tree about 4 ft. high, river canyon slopes, April 4, 1923, San Rafael, Macbride 3137.

These specimens seem to confirm Harms' observation in respect to *A. Michelii*, *A. libertatis* Harms, *A. incarum* Harms, l.c. 11, and *A. longocharpoides* Harms, l.c. 12, that "Die vier Arten stehen sich sehr nahe und sind vielleicht später in eine zusammenzufassen". However, the only authentic material of Harms' species before me is Weberbauer 7172, *A. incarum*. The Field Museum specimens are all from the Department of Junin and are in fruit, except for Macbride & Featherstone 2403, which closely matches the co-type material of *A. Michelii*. The two fruiting specimens appear to be similar; the ripe pods are glabrous or

minutely and sparsely appressed hispidulous, ligneous, about 6 cm. long and 13 mm. wide, the impressions about the seeds obscure without but with some cellular tissue partly dividing them within; the seeds are red-brown, suborbicular, flat, nearly 0.7 mm. across.

The genus *Apurimacia* Harms, l.c. 10, is apparently valid with much the aspect of *Coursetia* but with more of the characters of *Willardia*. From the latter it differs chiefly in its ligneous pods.

Coursetia perplexans, nom. nov. *Cracca poliophylla* Harms, Rep. Spec. Nov. xviii. 236 (1922), not *Coursetia polyphylla* Brandg. Univ. Calif. Pub. Bot. iv. 376 (1913).—PERU: between Amoray and Safaica, Dept. Apurimac, Oct. 1915, Weberbauer 7173; Huanuco, Sept. 23, 1922, Macbride & Featherstone 2449; Huanuco, April 5-8, 1923, Macbride 3248.

The generic position of this plant is undoubtedly open to question because of the presence of a bractlet a short distance beneath the calyx. This seems to be a character heretofore unnoted for any member of the subtribe *Robinianae*, at least as defined by Rydberg in his recent helpful revision of the North American *Galegeae*, Am. Journ. Bot. x. 485-498 (1923) and xi. 470-482 (1924). Nevertheless, the plant's disposition in the *Robinianae* is scarcely subject to argument. It cannot be referred, however, to *Benthamantha* (*Cracca* Benth.), as done by Harms, l.c., because its pods are not those of that genus. They are rather the pods of the closely related genus *Coursetia*, as they are not definitely nor strongly impressed between the seeds and the slight constrictions run obliquely to the pod-edges rather than at right angles as do the conspicuous ones that typify the pods of *Benthamantha*. Furthermore, the species is allied by habit and aspect to *Coursetia*. Although the presence or absence of a bractlet is used by Rydberg as one of the means of defining certain subtribes, it is certainly not significant in this case where the plant, notwithstanding this development, is so genuinely a member of the Robinianian genus *Coursetia*.

Indeed, it seems to be most closely related to the type of the genus, *Lathyrus fruticosus* Cav. Ic. i. 58. pl. 84 (1791)* from which it differs essentially only in the fewer leaflets (6-15) instead of about thirty. The material from Huanuco, especially, agrees almost exactly with Cavanilles' description, except for this discrepancy. It is not probable, however, that our plant is the same species since the difference in leaflet number is too great to be accounted for as a variation. I am, there-

**Coursetia fruticosa* (Cav.) comb. nov. *Lathyrus fruticosus* Cav. Ic. i. 58. pl. 84 (1791) [by error, *Astragalus fruticosus* in Rydberg's paper, Am. Journ. Bot. xi. 476 (1924)]; *Vicia fruticosa* Willd. Sp. Pl. iii. 1102 (1800); *Orobus tomentosus* Desf. Cat. Hort. Par. ed. 1. 195 (1804); *Orobus fruticosus* Pers. Syn. Pl. ii. 304 (1807); *Coursetia tomentosa* DC. Ann. Sci. Nat. iv. 92 (1825).

fore, transferring Harms' species from *Cracca* Benth. and, as his specific name "poliophylla" is, to all intents and purposes, preoccupied in the genus *Coursetia* by the valid *C. polyphylla* Brandg., l.c., I am renaming the plant *C. perplexans*. The work of Dr. Harms and Dr. Web erbauer has already received recognition in the names *Coursetia Harmsii* Ulbrich and *C. Weberbaueri* Harms.

In this connection the use of *Benthamantha* for *Cracca* Benth. may be considered. Botanists who follow the International Rules of Botanical Nomenclature (Vienna Congress 1905) have accepted, of course, the generic name *Tephrosia* Pers. Syn. Pl. ii. 328 (1807) for *Cracca* L. Sp. Pl. 752 (1753) and have therefore continued the use of *Cracca* Benth. ex Oersted in Kjøbenhavn Vidensk. Meddel. 8 (1853) for the small group of plants known by others as *Benthamantha* Alef. Bonplandia, 1862. 264 (1862). The use of *Cracca* Benth. under any circumstances is not correct, even under the International Rules with the consequent substitution of *Tephrosia* Pers. for *Cracca* L., because Art. 50 (Int. Rules) states that unless an earlier homonym (in this case, *Cracca* L.) is "universally regarded as non-valid" the later name is not to be changed. Now *Cracca* L. is used by all those who do not work under the International Rules and new species are continuously being proposed as "Craccas" with no particular indication on the part of their authors to which *Cracca* they belong. Surely, *Cracca* L. is far from "universally regarded as non-valid." Furthermore, the maintenance of *Cracca* Benth., even by those who substitute *Tephrosia* for *Cracca* L., creates "a permanent source of confusion or error" (cf. Int. Rules, Art. 51. 4) and therefore is to be rejected. The confusion is augmented by the general similarity of *Cracca* L. and *Cracca* Benth., technically distinct. For instance, Harms, l.c., in publishing *Cracca poliophylla* has made no direct indication whether he is proposing a new *Tephrosia* (*Cracca* L.) or a new *Cracca* Benth. so that the bibliographer (as witness the Gray Herbarium Card Index of New Genera and Species) can cite the name merely as "Cracca". The unreasonableness of maintaining *Cracca* Benth. so long as *Cracca* L. is in active use by a considerable number of botanists is further emphasized by Harms himself in designating *Cracca heterantha* (Griseb.) Harms, l.c., although this combination has been made previously by Kuntze, Rev. Gen. i. 175 (1891). Harms justifies his action on the ground that Kuntze made the transfer to *Cracca* L. (*Tephrosia*) rather than to *Cracca* Benth.

However, when we know more about the South American *Coursetias*, it may be possible to include the *Benthamanthas* or *Craccas* Benth. under one name which would be *Coursetia* DC., as it is the earliest.

The only character, all species considered, that distinguishes *Benthamantha* is found in the constrictions of the pod (cf. discussion above under *C. perplexans*) and this character is merely relative. The difference in seeds noted by Rydberg, N. A. Fl. xxiv. 220 (1924) doubtfully holds for the Peruvian species.

COURSETIA HARMΣII Ulbrich, Rep. Spec. Nov. ii. 12 (1906).—PERU: In shrubs, gravelly valley. Flowers pink-white. Tambo de Pariocota, Oct. 8, 1922, *Macbride & Featherstone* 2547.

This represents another collection from near the type locality, Department of Ancash. The pods are not quite mature but the largest is 6.5 cm. long and 4 mm. wide, rather abruptly apiculate, glabrous and thin (for the genus). Mature fruits showing the seed characters are greatly to be desired as they may make necessary a change in the present concept of the genus.

NISSOLIA FRUTICOSA Jacq. Enum. Pl. Carib. 27 (1760).—PERU: Sandy valley floor, La Merced, *Macbride* 5434.

This plant is a vine with yellow flowers that fade reddish. It is not mentioned by Weberbauer.

Machaerium Schunkei, spec. nov., arbor circa 4 m. alta; ramulis glabris; internodiis 2-3 cm. longis; stipulis demum indurato-spinescentibus, circa 9 mm. longis; petiolo communi 9-10 cm. longo fusco-pubescente; foliolis brevissime petiolulatis vulgo 17-23 late oblongis plerisque 2 cm. longis 1 cm. latis basi rotundatis apice retusis; lamina foliorum super opaca plus minusve discolori utrinque parce subadpresso pubescente, pube laxa, venulis obscure reticulatis non conspicuis, costa media prominente; panicula ampla laxa rufo-villosa, floribus pedicellatis, bracteolis calycem brevibus, legumine glabro circa 6.5 cm. longo stipite 5-8 mm. longo inclusa ad partem basilarem seminiferam 1 cm. lato; mediocriter contracto; ala chartacea supra medium circa 1.5 cm. lata.—PERU: Sandy valley floor, La Merced, Aug. 10-24, 1924, *Macbride* 5432 (TYPE, Field Museum).

Apparently this species, a member of the section *Lineata*, is most closely related to the Brazilian *M. amplum* Benth. as defined in Journ. Linn. Soc. iv. 55 (1860). It differs especially in the more numerous and retuse pubescent leaflets and in the definitely pubescent inflorescence, even in fruit.

M. Schunkei is only the third species known from Peru. The others are *M. floribundum* Benth., l.c. 68, belonging to the section *Penninervia*, and *M. angustifolium* Vog. Linnaea, xi. 193 (1837). From the latter, also a member of the section *Lineata*, *M. Schunkei* differs in the fewer larger and laxly pubescent leaflets. No *Machaerium* is listed by Web-erbauer.

This is a small 12-foot tree, the trunk and branches sparsely spiny. The pods are not quite mature. It is named for Mr. Carlos O. Schunke of La Merced, a naturalist who is well known to many entomologists and to growers of orchids and other tropical plants. He was my generous and helpful host for two weeks.

Machaerium Pittieri, nom. nov. *M. latifolium* (Benth.) Pittier, Contrib. U. S. Nat. Herb. xx. 470 (1922), not *M. latifolium* Rusby, Bull. N. Y. Bot. Gard. vi. 513 (1910).

This middle American species described by Pittier must be renamed because of the previous use of the word "latifolium" for a *Machaerium* of Bolivia.

ABRUS PRECATORIUS L. Syst. Nat. ed. 12, ii. 472 (1767).—PERU: La Merced, *Macbride* 5365.

Curiously enough this widely distributed tropical vine with well-known bright red and black seeds appears not to have been recorded from Peru.

CENTROSEMA SAGITTATUM (Humb. & Bonpl.) Brandg. ex Riley, Kew Bull. 1923. 344 (1923).—PERU: On herbs and low shrubs in shade, La Merced, *Macbride* 5392.

Riley, l.c., credits the transfer of this species (from *Glycine* to *Centrosema*) to Brandegee in Zoe, v. 202 (1905). According to the International Rules, however, which Riley in his use of the conserved generic name *Centrosema* evidently purports to follow, the transfer was not made there, for the citation is merely "incidental reference" and is not accompanied by "reference to a former description." The species is not mentioned by Weberbauer.

Rhynchosia apoloensis (Rusby) comb. nov. *Dolicholus apoloensis* Rusby, Bull. N. Y. Bot. Gard. vi. 515 (1910).—PERU: In hedgerows on sandy flats. Flowers yellowish. La Merced, Aug. 10-24, 1923, *Macbride* 5307. BOLIVIA: Milluguaya in Nord-Yungas, Dec. 1917, *Buchtien* 773; Buena Vista, Sara, Santa Cruz, March 5, 1921, *Steinbach* 5393.

Although Dr. Rusby, l.c., in proposing this plant as a new species, does not comment on its great resemblance to *R. melanosticta* Griseb. in Goett. Abh. xix. 124 (1874) it appears readily distinguishable from this Argentinian species by its constantly smaller flowers.

OCHROMA BOLIVIANA Rowlee, Journ. Wash. Acad. Sci. ix. 166 (1919).—PERU: La Merced, Aug. 10-24, 1924, *Macbride* 5250.

This well-known timber tree, "Palo de balsa", referred to *O. Lagopus* Sw. by Weberbauer, l.c. 98, is rather the Bolivian Balsa recently

described by Rowlee, l.c. He shows conclusively that *O. Lagopus* is confined to the West Indies. Although *O. boliviiana* is based entirely upon specimens from northeastern Bolivia, the Peruvian tree is, on floral characters, certainly not distinguishable. As the fruits of *O. boliviiana* have not been described, it may be noted that a nearly mature pod from Peru is 17.5 cm. long, borne on a stipe 9 cm. long. The tree from which number 5250 was taken was in flower and fruit. My field notes describe it as a "large tree with rather open crown, light-colored smoothish bark and white fleshy petals".

Malesherbia Galjufii, spec. nov., fruticosa erecta circa 7.5 dm. alta; caulis (vel ramis) ut videtur simplicibus ubique dense molliter villoso sed imprimis ad apicem; foliis numerosissimis cineraceo-viridibus sed utrinque dense subadpresso villosis subtus conspicue venosis et pilis patentioribus, margine plus minusve crenatis dense crispe ciliatis basi ad apicem cum pilis fulvescentibus fere 1 mm. longis, inferioribus ignotis, infra caulis medium fere sessilibus lineari-lanceolatis circa 8 cm. longis et 1 cm. latis basi et apice acutis vel apice acuminate; superioribus similibus sed gradatim reductis; stipulis angusto-linearibus dense ciliatis circa 8 mm. longis; racemis terminalibus congestis basi foliaceo-bracteatis circa 3 dm. longis, 7 cm. latis; pedicellis circa 8 mm. longis; floribus virido-flavescentibus longe pilosis; receptaculo cylindraceo 3.5-4 cm. longo, 9 mm. lato, medio vix inflato; sepalis lanceolatis acuminatis 7 mm. longis; petalis similibus sed brevioribus et tenuioribus; corona marginem irregulariter leviterque dentatum; staminibus circa 5 mm. exsertis; seminibus subovalibus minute et obscure elevatum longitudinaliter transversaliterque striatis.—PERU: In crevice of river-cliff, Huertas, June 26, 1922, Macbride & Featherstone 1347 (TYPE, Field Museum).

A handsome plant, evidently closely related to *M. cylindrostachya* Urb. & Gilg, Engl. Bot. Jahrb. xxxvii. 592 (1906), which I know only from description, but certainly not referable to that species because of the merely crenate rather than "inaequaliter profunde serratis vel dentatis" leaves, the much longer flowers, the less exserted stamens, etc. This is the seventh species of *Malesherbia* known from Peru; cf. Harms, Notizblatt, viii. 209-212 (1922).

Sr. Cristobal Galjuf of Huancavalica (Huaron), for whom this species is named, loaned me mules, supplies, and an arriero for a two weeks' trip from his coal mines to Ambo, on which journey this plant was discovered. It was found on a steep canyon side down which one of our pack animals had rolled, having lost his footing on the narrow trail several hundred feet above the streambed.

Columellia Andrei, spec. nov., ut videtur fruticosa erecta humilis; ramicis subtetragonis 0.5-1.5 dm. longis erecto-patentibus, glabris vel minute strigillosis, dense foliatis; foliis oblongo-ob lanceolatis 2-3 cm.

longis medio vel supra medium 5-8 mm. latis apice apiculatis basi sensim in petiolum brevis attenuatis, integris coriaceis supra lucidis glabris vel junioribus minute et parce puberulis subtus pallidioribus glabris vel margine minute hispidis; cymis terminalibusque uni- vel trifloris; calyce glabro, lobis ovato-oblongis subacutis circa 5 mm. longis; corolla glabra circa 8 mm. longa, 10 mm. lata.—ECUADOR: Chuquiribamba, Ed. André K1444 (TYPE, Field Museum); Cerro de St. Barbara, Nov. 18, 1876, Ed. André 4500.

It is interesting to add one more species to this monogeneric family of South American plants. Schlechter records six in his revision of the group, *Notizblatt*, vii, no. 68. 11 (1920), but he did not know *C. Mathewsi* Briq. *Ann. Conserv. et Jard.* xx. 367 (1919) which, from description, is apparently valid. The recognition of the present species, therefore, brings the total of known *Columelli*as to eight and this last member is one of the most distinctive by virtue of its essential glabrousness. Its completely entire leaves seem to ally it to *C. sericea* HBK. or *C. subsessilis* Schltr. but it lacks entirely the characteristic pubescence of the former while the leaves average distinctly larger than the pubescent ones of the latter.

I am not altogether certain that the plant is Ecuadorian, for the label does not so state and André's *Rapport sur une mission scientifique dans l'Amérique du Sud*, *Arch. Inst. Sc. Litt.* iii. 5 (1878), which may list his collecting stations, is not at hand. There is, however, a locality "Chuquiribamba" in southwestern Ecuador and other of André's numbers in the forty-five hundreds are from that country.

TWO NEW SPECIES OF CANAVALIA

by

C. V. Piper, United States Department of Agriculture

Among the very interesting plants collected in Peru by J. Francis Macbride in 1923 are two undescribed species of *Canavalia* which were received too late to be included in the paper on the American species of the genus published in the Contributions of the National Herbarium.

Canavalia eurycarpa Piper, spec. nov. (sect. *Didiplopleura*). Glabrous climbing shrub; stems stout, terete, woody, becoming 5 mm. thick; stipules and stipels not seen; petioles about as long as the leaflets; petiolules glabrous, 6 mm. long; leaflets chartaceous, oval, the lateral ones oblique, acute, rounded at base, scarcely paler beneath, 10-12 cm. long; peduncles 10-20 cm. long, 15-30-flowered; pedicellar glands prominent, scattered; pods linear, straight, woody, brown, stoutly stipitate, shortly recurved-beaked at apex, 18 cm. long, 3-4 cm. broad, each valve longitudinally 4-ridged, one very close to each suture, the others more prominent, 2 mm. from each suture; inner layer not separating; seeds ellipsoid, much compressed, brown, shiny, $23 \times 12 \times 3$ mm., the black hilum as long as the seed.—PERU: Pozuzo, alt. 2000 ft. on sunny brush-montaña, June, 1923, *Macbride 4580* (TYPE, Field Museum 535657).

This is the second species known for the section.

Canavalia peruviana Piper, spec. nov. (sect. *Eucanavalia*). Liana; stems terete, densely ferruginous puberulent when young, becoming woody and 5 mm. in diameter; stipules oblong-ovate, acute, puberulent, 3 mm. long; petioles puberulent, shorter than the leaflets; stipels subulate, stiff, black, 1.5 mm. long; leaflets coriaceous, broadly lance-oblong, truncate at base, slightly acuminate at apex to a blunt apiculate tip, the upper surface dark green, shiny, slightly puberulent especially on the veins, the lower surface paler, densely puberulent, 10-12 cm. long, the lateral ones slightly oblique; peduncles stout; pod linear, stoutly short-stipitate, short-beaked at apex, densely black puberulent, each valve with an indistinct ridge along each suture and a prominent one 2 mm. from the ventral suture, 10-12 cm. long, 18 mm. broad, 10-seeded; inner layer closely attached; seeds ellipsoid, very much compressed, gray, speckled and splotched with black, $10 \times 6 \times 1.5$ mm.; hilum linear, three-quarters as long as the seed.—PERU: River banks, La Merced, alt. 2000 ft., August, 1923, *Macbride 5551* (TYPE, Field Museum 536591).

Nearest perhaps to *Canavalia boliviiana* Piper but not at all closely related.

TWO NEW EUPHORBIAS

by

C. F. Millspaugh

Tithymalus (*Ipecacuanhae*) **raphanorrhizus** Millsp., spec. nov., perennial, glabrous, prostrate from a fusiform root. Branches few, filiform; leaves orbicular, crenulate, petiolate, the lower scattered-alternate, few-crenulate, obtuse; upper opposite, crenulo-serrate, acute to apiculate, stipules none. Inflorescence solitary in the axils, sessile; involucres campanulate, glabrous; lobes oblong, fibrillate at apex; glands transversely ovate, thick, stipitate, the stipe prolonged to the base of the tube. Styles bifurcate one-third their length, stigmas globose. Capsule glabrous deeply tricoccus; seeds triangular-ovoid, white, 2×1.5 mm. the facets smooth, the angles sharp; caruncle (?) circular, papyraceous papillate.—PERU: On a steep lichen covered western slope, alt. 8000 ft., Matucana, April 12, 1922, *Macbride & Featherstone* 85 (TYPE, Field Museum 516618).

Tithymalus (*Ipecacuanhae*) **pencillatus** Millsp., spec. nov., prostrate or decumbent perennial, rootstalk thick, latex very viscid; plant glabrous, branches succulent; lower leaves few, alternate, sessile, ovate-spatulate, upper ovate, apiculate, the margin ciliate with multilocular hairs, all slightly repand-denticulate. Inflorescence solitary in the axils of the upper leaves; involucres red, campanulate, pedicels about the length of the tube or longer; teeth oblong, ciliate-fibrillate above; glands orbicular, entire, agaricoid, papillate, the stipe central, thick; styles bifid about one-quarter their length, clavate, pencillate. Capsule strongly tri-coccus, glabrous. Seed ecarunculate, ovoid-quadrangular the angles sharp, bluish-white until fully ripe then chocolate-brown, 2×1.8 mm.; dorsal facets smooth, ventral with one transverse sulcus and two large rounded mammiform prominences near the median line.

Branches 7-14 cm. long; lower leaves 8-10 mm. long, upper 12-15 mm. Sap of root extremely viscid.—PERU: In loose soil of a grassy slope, Matucana, 8000 ft. alt., April 19, 1922, *Macbride & Featherstone* 299 (TYPE, Field Museum 516833).

*This may be only vestigial from the funicular attachment. It is, however, present and alike on every seed examined.

FIELD MUSEUM OF NATURAL HISTORY

FOUNDED BY MARSHALL FIELD, 1893

PUBLICATION 258

BOTANICAL SERIES

VOL. IV, No. 6

I. SUPPLEMENT TO THE FLORA OF BARRO
COLORADO ISLAND, PANAMA

LESLIE A. KENOYER AND PAUL C. STANDLEY

II. TWO NEW SPECIES OF CHARA
FROM TROPICAL AMERICA

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CHICAGO, U. S. A.

July 5, 1929

**PRINTED IN THE UNITED STATES OF AMERICA
BY FIELD MUSEUM PRESS**

SUPPLEMENT TO THE FLORA OF BARRO COLORADO ISLAND, PANAMA

LESLIE A. KENOYER AND PAUL C. STANLEY

The first list of the plants of Barro Colorado Island in Gatún Lake, Canal Zone, the site of the laboratory of the Institute for Tropical Research, was published by Paul C. Standley in May, 1927, in the Smithsonian Miscellaneous Collections.¹ In that list 611 species of flowering plants and cryptogams were listed. Because of the large area of the island—about six square miles—and the small amount of time which had been devoted to its exploration, it was evident that its flora was then but imperfectly known.

In the summer of 1927, L. A. Kenoyer spent eight weeks on Barro Colorado Island, studying the plant ecology. In connection with his work there was made a large collection of plant specimens, amounting to 680 numbers. The present list is based upon this collection.

Most of the flowering plants here recorded have been determined by Mr. Standley, and the ferns by William R. Maxon. On the following pages there are enumerated 187 species new to the Barro Colorado flora. Several of these are plants unknown previously from the region of the Canal Zone, and four seem to belong to unpublished species, which are described here as new. There remain several plants, represented only by sterile material, which it has not been possible to determine definitely. These uncertain specimens doubtless belong to species not recorded from the island, and probably unknown at present from the Canal Zone area.

The large number of new ferns reported for the island is especially noteworthy. An annotated list of them already has been published.² It is not surprising that intensive collecting, extended over several weeks, should have added so large a number of plants to the known flora of Barro Colorado Island. As the island is explored more thoroughly, there is no doubt that the number will be increased substantially. This is particularly true in the case of the fungi and other groups of the lower plants.

¹Volume 78, No. 8, pp. 1-32

²Kenoyer, Amer. Fern Journ. 18: 6-14. 1928.

CYATHEACEAE. Tree Fern Family

Alsophila tenerifrons Christ. Probably the largest tree fern on the island, attaining a height of 8 meters. Growing in several of the ravines. There are large specimens on Pearson Trail 100 yards from the laboratory.

Alsophila microdonta Desv. A small tree fern, collected along the shore at far end of the Gross Trail.

GLEICHENIACEAE. Gleichenia Family

Dicranopteris flexuosa (Schrad.) Underw. A vine, forming tangles along exposed shores. End of Gross Trail and on Orchid Island.

POLYPODIACEAE. Polypody Family

Acrostichum daneaefolium Langsd. & Fisch. A tall coarse fern, abundant in marshes along the lake shore. Previously noted but not definitely placed as to species.

Adiantum obliquum Willd. Occasional in virgin forest.

Adiantum petiolatum Desv. Frequent in forest.

Adiantum villosum L. Common in virgin forest.

Adiantum sp. Hairy, with bipinnate leaves. Occasional.

Asplenium laetum Swartz. Fairly common, especially in ravines.

Blechnum occidentale L. On an eroding clay bank, Orchid Island at French lock site.

Dennstaedtia rubiginosa (Kaulf.) Moore. A large ravine fern. Pearson Trail.

Dryopteris gongyloides (Schk.) Kuntze. Marshes along lake shore; frequent.

Dryopteris serrata (Cav.) C. Chr. Marshes along lake shore; frequent.

Dryopteris sordida Maxon. A large ravine fern; occasional.

Dryopteris Sprengelii (Kaulf.) Kuntze. A large ravine fern with a short upright stem.

Hemidictyum marginatum (L.) Presl. A tall coarse ravine fern with pinnate leaves.

Leptochilus nicotianaefolius (Swartz) C. Chr. A coarse terrestrial plant.



FIG. 1 THE APPROACH TO THE LABORATORY ON BARRO COLORADO ISLAND FROM GATUN LAKE



FIG. 2 FERNS (*NEPHROLEPIS PENDULA*) ON ERODED BANK AT THE EDGE OF
BARRO COLORADO ISLAND

Maxonia apiifolia (Swartz) C. Chr. Terrestrial or epiphytic, the trailing rhizome covered with brown scales.

Nephrolepis biserrata (Swartz) Schott. Abundant in marshes.

Polybotrya villosula Christ. A trailing epiphyte with large bipinnate leaves; growing especially on tree ferns.

Polypodium costaricense Christ. An epiphyte; frequent.

Polypodium phyllitidis L. A coarse epiphyte; common.

Pteris grandifolia L. A coarse ravine fern with pinnate leaves four meters long.

Pteris Kunzeana Agardh. In ravines.

Pteris propinqua Agardh. Low areas in forest.

Pteris pungens Willd. Virgin forest.

HYMENOPHYLLACEAE. Filmy-fern Family

Trichomanes diversifrons (Bory) Mett. Shaded ravine bank on Pearson Trail near laboratory.

LYCOPIDIACEAE. Clubmoss Family

Lycopodium dichotomum Jacq. A single specimen fallen from a tree on which it had grown as an epiphyte.

ALISMACEAE. Water-plantain Family

Sagittaria lancifolia L. An acaulescent plant with lanceolate leaves and racemes of white flowers. Frequent in marshes along shore.

POACEAE. Grass Family

Andropogon bicornis L. Very common in clearings and in marshes offshore.

Andropogon brevifolius Swartz. Near French lock site, Orchid Island.

Andropogon glomeratus (Walt.) B. S. P. A tall coarse grass. Laboratory clearing.

Chloris virgata Swartz. Laboratory clearing.

Ichnanthus tenuis (Presl) Hitchc. & Chase. Range light clearing.

Isachne polygonoides (Lam.) Doell. Marsh near Termite House.

Leersia hexandra Swartz. Clearing at Barbour Navigation Signal.

Leptochloa virgata (L.) Beauv. Frequent in clearings.

Panicum barbinode Trin. An extensive marsh former in the lake.

Panicum fasciculatum Swartz. Clearing at highest point of the island.

Panicum geminatum Forsk. Marsh near Termite House.

Panicum megiston Schult. Marsh near Termite House.

Panicum zizanioides H. B. K. Marsh near Termite House.

Paspalum decumbens Swartz. A prostrate grass in forest.

Paspalum saccharoides (Swartz) Nees. Clearing at Fairchild Navigation Signal.

Phragmites communis Trin. REED. A tall coarse marsh grass in lake near laboratory.

Setaria paniculifera (Steud.) Fourn. French lock site, Orchid Island.

Sporobolus indicus R. Br. Clearing at Barbour Navigation Signal.

CYPERACEAE. Sedge Family

Cyperus luzulae (L.) Retz. Marshes near laboratory landing.

Cyperus rotundus L. Abundant in clearings.

Cyperus simplex H. B. K. Clearings and trails; frequent.

Eleocharis variegata var. *laxiflora* (Thwaites) Ridley. Marshes near laboratory landing.

Rynchospora corymbosa (L.) Britton. A large marsh plant with 3-angled stem, south and west shores of the island.

Rynchospora micrantha Vahl. French lock site, Orchid Island.

Scirpus cubensis Kunth. Marshes near Redwood House.

Scleria mitis Berg. Abundant in clearings.

Scleria paludosa Kunth. A coarse marsh sedge.

PHOENICACEAE. Palm Family

Attalea gomphococca Mart. COROZO. COHUNE PALM. The largest palm on the island. Abundant. The large fruits, borne in huge dense pendent panicles, are rich in oil.

ARACEAE. Arum Family

Anthurium acutangulum Engler. An epiphytic climber with thick lance-ovate leaves.

Anthurium linearifolium Engler. A frequent epiphyte with oblong-linear leaves.

Anthurium rigidulum Schott? An epiphyte on a stump in the lake.

Montrichardia arborescens (L.) Schott. An upright shrublike plant, frequent in lake shore marshes near the laboratory. The large spathes are white and showy, resembling those of the cultivated calla.

Philodendron panamense Krause. A common trailing epiphyte.

Xanthosoma pilosum Koch. A common terrestrial plant with large, finely pubescent, broadly sagittate leaves.

BROMELIACEAE. Pineapple Family

Aechmea pubescens Baker. A frequent epiphyte.

Tillandsia compressa Bert. An epiphyte with compressed flower spikes.

Tillandsia fasciculata Swartz. An epiphyte on stump near Termite House.

COMMELINACEAE. Dayflower Family

Tradescantia cumanensis Kunth. Laboratory clearing.

PONTEDERIACEAE. Pickerelweed Family

Pontederia cordata L. PICKERELWEED. Marshes near Termite House.

AMARYLLIDACEAE. Amaryllis Family

Crinum erubescens Soland. A coarse bulbous plant with umbels of showy flowers. Frequent along shores of Gatún Lake.

MUSACEAE. Banana Family

Heliconia platystachys Baker. A tall plant with recurved inflorescence, the bracts red and yellow.

ORCHIDACEAE. Orchid Family

Dichaea sp. An epiphyte on a large living *Bombacopsis* in Gatún Lake.

Habenaria alata Hook. A terrestrial plant. Clearings and marsh islands.

Stelis sp. An epiphyte.

Stenorhynchus sp. Terrestrial.

Triphora cubensis (Reichenb.) Ames. A terrestrial and apparently saprophytic plant. Found in the laboratory clearing. "This species was originally found in Cuba but is uncommon there, and in places where it has been found seems to appear at irregular intervals. It has also been found in Florida, but only once." (Oakes Ames).

PIPERACEAE. Pepper Family

Peperomia mameiana C. DC. A succulent epiphyte. Occasional.

Piper breve C. DC. A shrub. Barbour Point.

Piper peltatum L. A common shrub in clearings. Easily recognized by the peltate leaves.

Piper peracuminatum C. DC. A shrub. Fairchild Point.

MORACEAE. Mulberry Family

Cecropia longipes Pittier. GUARUMO. Fruiting spikes in 4's. A common tree.

Cecropia mexicana Hemsl. GUARUMO. Fruiting spikes in pairs, elongated. A common tree.

Cecropia sp. Leaves about 8-lobed, very white beneath, without brown hairs. Fruiting spikes in 8's, drooping, wavy. Frequent.

Ficus colubrinae Standl. An epiphytic shrub or small tree in virgin forest.

Ficus involuta (Liebm.) Miq. Pearson Trail near laboratory. A tree with large wedge-shaped leaves, rounded at apex.

Pououma aspera Trecul. A Cecropia-like tree near laboratory. Leaves similar to those of *Cecropia*, but not peltate.

URTICACEAE. Nettle Family

Pouzolzia obliqua Gaud. A low tree with entire leaves; along shore near laboratory.



FIG 1 VIEW IN THE FOREST ON BARRO COLORADO ISLAND



FIG 2 BASE OF PLANT OF RENALMIA AROMATICA SHOWING THE INFLORESCENCES

OLACACEAE. Olax Family

Heisteria longipes Standl. An occasional shrub in forest. Leaves entire; fruiting calyx saucer-shaped, dark red.

ARISTOLOCHIACEAE. Birthwort Family

Aristolochia pilosa H. B. K. A small herbaceous climber. On short cut from Barbour Trail.

POLYGONACEAE. Buckwheat Family

Polygonum punctatum Ell. SMARTWEED. Stump islands near Redwood House.

AMARANTHACEAE. Pigweed Family

Amaranthus gracilis Desf. PIGWEED. Laboratory clearing. Introduced.

Gomphrena dispersa Standl. A weedy herb with small heads of white flowers. Laboratory clearing, probably introduced.

PHYTOLACCACEAE. Pokeweed Family

Microtea debilis Swartz. A small weak weedy herb.

Phytolacca rivinoides Kunth and Bouché. POKEWEED. A coarse weed in laboratory garden.

Rivina humilis L. A weed in laboratory garden. An erect herb with racemes of small whitish flowers, and small, bright red fruits.

ANNONACEAE. Custard-apple Family

Annona glabra L. PONDAPPLE. A large shrub or small tree. Lake shore near laboratory.

Guatteria dolichopoda Donn. Smith. A tall tree on Armour Trail. Species new to the Canal Zone.

Unonopsis Pittieri Safford. A tree near the laboratory.

Xylopia frutescens Aubl. A small tree with lanceolate distichous leaves. Near Gross Point.

RAFFLESIACEAE. Rafflesia Family

Apodanthes flacouriae Karst. A parasite on the branches of *Xylosma Hemsleyana*. Found at several places in the forest near

Barbour Point. This is the first report of the family for Central America. The plants appear as rows of white waxy flowers 5 mm. in diameter, which burst through the bark of the host.

HYDRANGEACEAE. Hydrangea Family

Hydrangea panamensis Standl. A trailing woody epiphyte, frequent on the large trees.

AMYGDALACEAE. Almond Family

Licania platypus (Hemsl.) Fritsch. A frequent large tree about the laboratory.

MIMOSACEAE. Mimosa Family

Acacia melanoceras Beurl. BULLHORN ACACIA. A small specimen growing near the laboratory.

Inga leptoloba Schlecht. Shore near Termite House.

Inga punctata Willd. Shore near the laboratory.

Inga Roussoviana Pittier. Slothia Island.

Inga Ruiziana Don. Shore near the laboratory.

Inga spectabilis Willd. Pearson Trail. The species of *Inga* are all trees with heads or spikes of white blossoms.

Pithecellobium rufescens (Benth.) Pittier. A small tree on Slothia Island. Leaves once pinnate, like those of *Inga*.

CAESALPINIACEAE. Senna Family

Cassia reticulata Willd. A small tree with showy, bright yellow flowers, near Termite House.

Cassia tora L. An herb at French lock site, Orchid Island.

FABACEAE. Bean Family

Dalbergia ecastophyllum (L.) Taub. A shrub in marshes along the shore.

Erythrina glauca Willd. A tree in clearing at Barbour Navigation Signal. Flowers orange-colored.

Pterocarpus Hayesii Benth. A large tree on Wheeler Trail.

Vigna vexillata (L.) Rich. An herbaceous vine with pale yellow flowers. Marshes near Redwood House.



FIG. 1 OPHIOMERIS PANAMENSIS, AT LEFT, AND LEIPHAIMOS ALBUS



FIG. 2 APODANTHES FLACOURTIAE, GROWING ON TRUNK OF XYLOSMA HEMSLEYANA

RUTACEAE. Rue Family

Zanthoxylum microcarpum Griseb. A tall tree with fine stellate pubescence. On Snyder-Molino Trail.

Zanthoxylum setulosum P. Wils. A forest tree.

BURSERACEAE. Torchwood Family

Protium panamense (Rose) Johnston. A tree on Van Tyne Trail.

MALPIGHIACEAE. Malpighia Family

Bunchosia cornifolia H. B. K. A shrub with yellow flowers. Gross Point.

Byrsonima crassitolia (L.) DC. NANCE. A small tree with leaves whitened beneath, and yellow flowers. Fruit edible.

Hiraea faginea (Swartz) Niedenzu. A climbing shrub with yellow flowers. Leaves silky-pubescent beneath.

Stigmaphyllon ellipticum (H. B. K.) Juss. A climbing yellow-flowered shrub with entire leaves and winged fruits. Clearings and stump islands.

POLYGALACEAE. Polygala Family

Polygala paniculata L. A small herb at French lock site, Orchid Island.

EUPHORBIACEAE. Spurge Family

Croton glandulosus L. A small weed with dentate leaves, in the laboratory clearing.

Euphorbia heterophylla L. A coarse erect weed with milky sap. Laboratory clearing.

Sapium aucuparium Jacq.? A shrub in ravine near the laboratory.

Sapium jamaicense Swartz. A tree on Barbour Trail. Species new to the Canal Zone. The species of *Sapium* are easy to recognize because of their milky sap, and the presence of two glands near the apex of the petiole. The latex, of some species at least, contains rubber.

SAPINDACEAE. Soapberry Family

Paulinia pinnata L. A liana with red capsules, frequent along shore.

STAPHYLEACEAE. Bladdernut Family

Turpinia paniculata Vent. A tree with panicles of small white flowers, on Wheeler Trail.

VITACEAE. Grape Family

Cissus rhombifolia Vahl. A common woody climber with red flowers and trifoliolate leaves.

MALVACEAE. Mallow Family

Hibiscus bifurcatus Cav. A coarse pink-flowered herb or half-shrubby plant. Shore near Barbour Point.

Hibiscus sororius L. f. A coarse semi-shrubby plant with white flowers. Abundant on offshore marsh islands.

BOMBACACEAE. Cottontree Family

Quararibea asterolepis Pittier. A common large tree with smooth green bark and plank buttresses. The dried leaves have the odor of slippery elm.

ELAEOCARPACEAE. Elaeocarpus Family

Sloanea microcephala Standl., sp. nov.—Arbor mediocris, ramulis junioribus crassis, subteretibus, dense et minute tomentulosis; petioli 11 cm. longi, subteretes, brunneo-tomentulosi; limbus ellipticus, 40 cm longus, 23 cm. latus, apice et basi rotundatus, margine fere ad basin dense sinuato-crenata, crenationibus late obtusis, subcoriaceus, supra glaber, subtus pallidior, ad nervos minutissime tomentulosus, nervis lateralibus utroque latere 17, elevatis, percurrentibus, leviter arcuatis, nervulis fere rectis, reticulato-conjunctis; panicula axillaris, 4 cm. longa, pedunculata, pedunculo compressiusculo, 2.5 cm longo, ramulis tomentellis, bracteis 4-6 mm. longis, oblongis, obtusis, tomentulosis, floribus numerosis, 4 mm diam., pedicellis 5-8 mm longis; calyx rotatus, 2.5 mm latus, extus griseo-tomentulosus, obscure lobatus, lobis late triangularibus, acutiusculis; stamina numerosa, antheris cuneiformibus, sessilibus, glabris, apice rotundatis.

PANAMA: Along shore near Termite House, Barro Colorado Island, Canal Zone, Aug. 6, 1927, L. A. Kenoyer 468 (Herb. Field Mus. No. 579761, TYPE).

DILLENIACEAE. Dillenia Family

Doliocarpus olivaceus Sprague & Williams A woody climber with toothed leaves. Near the laboratory.

Tetracera oblongata DC. A retrorsely scabrous, woody climber. Snyder-Molino Trail.

Tetracera sessiliflora Triana and Planch. A coarse woody vine with elm-like leaves. Shore line.

OCHNACEAE. Ochna Family

Cespedesia macrophylla Seem. A tall tree with long simple leaves and large showy flowers. Gross Point. The genus is new to the Canal Zone.

HYPERICACEAE. St. Johnswort Family

Vismia latifolia Choisy. A small tree, the leaves rusty-tomentose beneath. On shore near Redwood House.

CLUSIACEAE. Clusia Family

Calophyllum calaba Jacq. A large tree on Pearson Trail near the laboratory. The specimens are imperfect, but probably referable to this species, which is new to the region.

Clusia minor L. A frequent small tree, often beginning growth as an epiphyte.

BIXACEAE. Anatto Family

Bixa Orellana L. ANATTO. A small tree or large shrub. Occasional. Probably introduced.

COCHLOSPERMACEAE. Cochlospermum Family

Cochlospermum vitifolium Willd. A small tree with palmately lobed leaves and large yellow flowers resembling roses. Orchid Island.

FLACOURTIACEAE. Flacourtia Family

Banara guianensis Aubl. A small tree. Lake shore near the laboratory.

Xylosma Hemsleyana Standl. A small spiny shrub. Frequent in the neighborhood of Barbour Point.

Zuelania Roussoviae Pittier. A small tree with oblong to oval leaves.

PASSIFLORACEAE. Passionflower Family

Passiflora biflora Lam. A frequent white-flowered climber.

Passiflora hispida DC. An herbaceous vine. Range light clearing.

BEGONIACEAE. Begonia Family

Begonia ciliibracteolata C. DC. Marsh island near Redwood House.

Begonia sp. A bushy herb a meter high. In forest near the laboratory.

CACTACEAE. Cactus Family

Rhipsalis cassutha Gaertn. MISTLETOE CACTUS. A cylindrical jointed epiphyte, without leaves, forming large masses on tall trees. Frequent.

LYTHRACEAE. Loosestrife Family

Cuphea Wrightii Gray. A small weed at French lock site, Orchid Island. The species is new to the Canal Zone.

MYRTACEAE. Myrtle Family

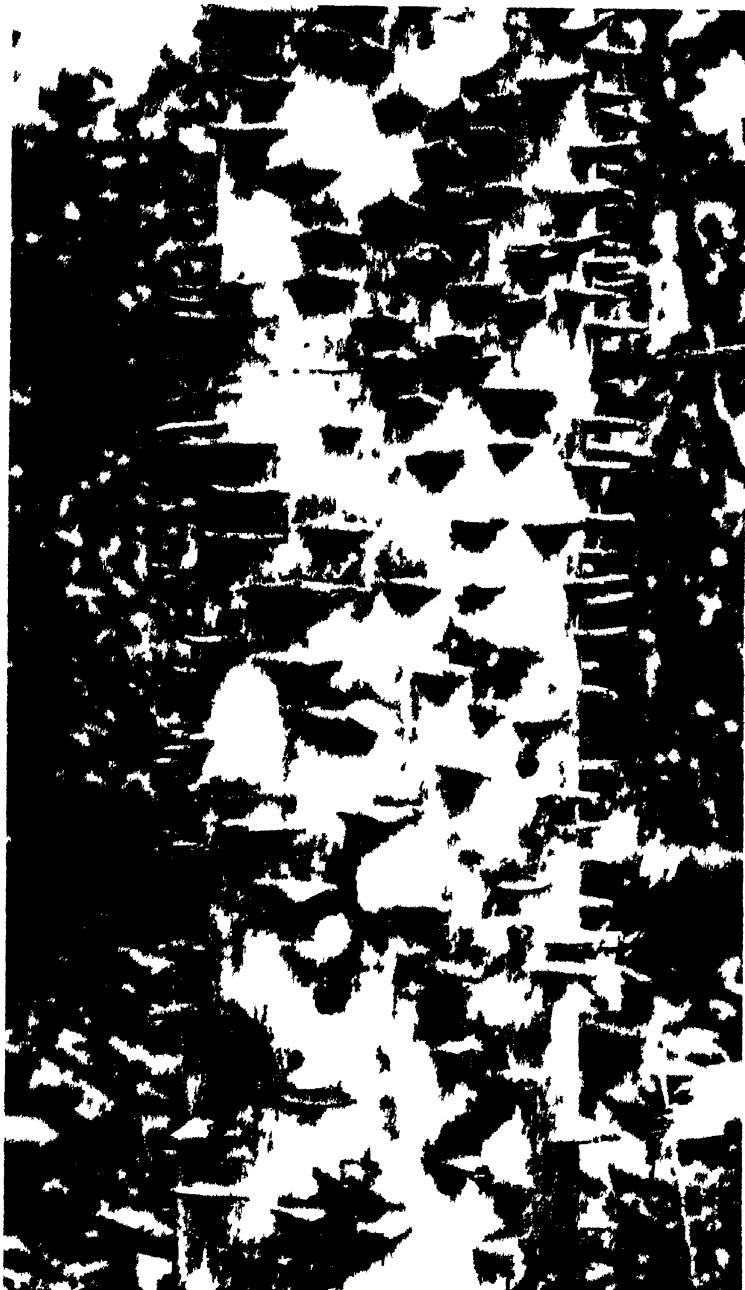
Eugenia sericifolia Benth. A shrub with entire lanceolate leaves. Wheeler Trail.

Myrcia gatunensis Standl., sp. nov.—Arbor parva, ramulis gracilibus, teretibus, cinereo-strigillosis vel glabratiss, internodiis 1-3.5 cm. longis; petioli 1-2 mm. longi, strigillosi; limbus lanceolato-oblongus, 7.5-10.5 cm. longus, 2-3.5 cm. latus, subabrupte longi-acuminatus, acumine angusto, obtuso, basi obtusus vei rotundatus, crasse chartaceus, dense et minute pellucido-punctatus, supra lucidus, glaber vel ad costam minute puberulus, nervis prominulis, subtus brunnescens, lucidulus, sparse strigilosus, nervis lateralibus utroque latere c. 19, gracillimus, fere rectis, prope marginem nervum collectivum efformantibus; paniculae laterales et terminales, laxe multiflorae, foliis breviores, 3-4 cm. longae, pedunculatae, ramulis gracilibus, sparse strigilosis, pedicellis fere filiformibus, 1-2.5 mm. longis, sparse strigilosis; hypanthium 1 mm. longum et latum, dense cinereo-strigilsum, calycis limbo abrupte patente, lobis late ovatis, obtusissimis, glabratis; petala alba, rotundata, 1.5-2 mm. longa, venosa, punctata, extus sparse strigillosa; stamina numerosa, petala excedentia, filamentis glabris; stylus 3 mm. longus, versus basin pilosulus.

PANAMA: Barro Colorado Island, Canal Zone, near the lake on Barbour Trail, July 14, 1927, L. A. Kenoyer 468 (Herb. Field Mus. No. 579760, TYPE).

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BOTANY VOL IV PL XIV.



TRUNK OF *ZANTHOXYLUM* SP. SHOWING THE CURIOUS FLATTENED CORKY PRICKLES

MELASTOMACEAE. Melastome Family

Clidemia neglecta Don. A brown-hairy shrub. Shore line near Gross Point.

Leandra dichotoma Cogn. A shrub on Pearson Trail.

ONAGRACEAE. Evening-primrose Family

Jussiaea natans H. B. K. A floating aquatic with yellow flowers. Near Termite House.

UMBELLIFERAE. Parsley Family

Eryngium foetidum L. A strong-scented weed along trails and in clearings.

SAPOTACEAE. Sapodilla Family

Chrysophyllum panamense Pittier. STAR-APPLE. A tall tree in forest

GENTIANACEAE. Gentian Family

Leiphaimos albus Standl. (Plate XIII.) A small white saprophyte with white flowers in cymes. The species is new to the Canal Zone.

APOCYNACEAE. Dogbane Family

Allamanda cathartica L. A woody vine with large showy yellow flowers and spiny capsules. Marsh island near Termite House.

Aspidosperma megalocarpon Muell. A large tree. Fruits picked up in tall virgin forest. The seeds are surrounded by a broad thin wing. The genus is new to Panama.

Prestonia ipomoeifolia A. DC.? An epiphyte on stump near Termite House.

ASCLEPIADACEAE. Milkweed Family

Funastrum clausum (Jacq.) Schlechter. A slender herbaceous climber with umbels of white flowers. Marsh islands in the lake.

CONVOLVULACEAE. Morning-glory Family

Ipomoea batatas (L.) Lam. SWEET-POTATO. Abundant as an escape in the laboratory garden.

BORAGINACEAE. Borage Family

Cordia bicolor A. DC. A small tree. Range light clearing.

Cordia ferruginea (Lam.) Roem. & Schult. A shrub. Barbour Navigation Signal clearing.

Cordia sericalyx A. DC. A very large tree near Redwood House.

VERBENACEAE. Verbena Family

Aegiphila cephalophora Standl., sp. nov.—Frutex subscandens, ramulis gracilibus, subteretibus, dense pilis ochraceis adpressis obtectis, internodiis 4-6.5 cm. longis; petioli 5-6 mm. longi, crassi, dense pilis adscendentibus pilosi; limbus lanceolato-oblongus, c. 12 cm. longus et 4 cm. latus, longiacuminatus, acumine angusto, longe attenuato, basi obtusus, membranaceus, integer, supra pilis tenuibus adpressis sparse, ad costam magis dense, pilosus, subtus dense adpresso-pilosus, nervis lateralibus utroque latere c. 10, gracillimus, angulo lato adscendentibus, arcuatis; cymae capituliformes, densae, multiflorae, axillares, solitariae, 1-1.5 cm. latae, pedunculis validis, 1-2.5 cm. longis, densissime adpresso-pilosus, floribus sessilibus; bracteae numerosae, anguste lineares, calyce multo longiores, dense longipilosae; calyx late turbinatus, 2.5 mm. longus, extus dense pilosus, intus glaber, limbo truncato, remote 4-5-denticulato; corolla alba, c. 6 mm. longa, glabra, 3-5-lobata, staminibus longe exsertis.

PANAMA: Shannon Trail, Barro Colorado Island, Canal Zone, July 23, 1927, L. A. Kenoyer 607 (U. S. Nat. Herb. No. 1,317,604, TYPE).

Related to *A. Deppeana* Steud., in which the inflorescence is much less congested and the leaves tomentose beneath. The material of *A. cephalophora* at hand is very scant, and it is, therefore, impossible to supply a complete and wholly satisfactory diagnosis of the species.

SOLANACEAE. Potato Family

Cyphomandra heterophylla Donn. Smith. A small tree with pinnately lobed leaves, and large fleshy fruits. Near Chapman House.

Physalis pubescens L. GROUNDCHERRY. An occasional weed in clearings.

Solanum asperum Rich. A common clearing shrub with narrow scurfy leaves.

Solanum Donnell-Smithii Coulter. A prickly woody climber; frequent. The species is new to the Canal Zone.



FIG. 1 BASE OF TRUNK OF *BOMBACOPSIS FENDLERI* THE LARGEST TREE OF BARRO COLORADO ISLAND SHOWING THE BUTTRESSES THE PALM IS *ACANTHORRHIZA WARSCEWICZII*



FIG. 2 BASE OF A TRUNK OF *OURATEA WRIGHTII*

Solanum Kenoyeri Standl., sp. nov.—Frutex, ramulis validis, subteretibus, glabris, internodiis 3.5-4 cm. longis; folia valde inaequalia; foliorum minorum petioli breves, limbo rotundato, 6.5 cm. longo, 5.5 cm. lato, apice obtuso; foliorum majorum petiolus validus, 1 cm. longus, limbo oblongo-elliptico, 18-20 cm. longo, 8.5-10 cm. lato, apice breviter acuminato, basi oblique obtuso, integro, supra nitidulo, glabro, subtus brunneo-viridi, ad nervos minutissime puberulo, nervis lateralibus utroque latere c. 9, adscendentibus, arcuatis, tenuibus; inflorescentiae axillares, umbelliformes, c. 6-florae, pedunculatae, pedunculo 6 mm. longo, pedicellis validis, erectis vel recurvatis, glabris, 5-6 mm. longis; calyx campanulatus, 2.5 mm. longus, glaber, lobis 5, late ovatis, obtusis, tubum aequantibus; corolla alba, 5-6 mm. longa, glabra, profunde lobata, lobis anguste lanceolato-oblongis, obtusis; antherae oblongae, 3 mm. longae, apice obtusae, biporosae.

PANAMA: Lutz Trail, Barro Colorado Island, Canal Zone, July 22, 1927, L. A. Kenoyer 515 (U. S. Nat. Herb. No. 1,317,601, TYPE).

This *Solanum* is of occasional occurrence in the wet forests of the Atlantic slope of the Canal Zone, but it has not been found in flower previously.

Solanum nigrum L. BLACK NIGHTSHADE. A weed in the laboratory garden.

BIGNONIACEAE. Bignonia Family

Adenocalymna foveolatum (DC.) Bur. A woody climber. Lake shore.

GESNERIACEAE. Gesneria Family

Besleria laxiflora Benth. A woody climber near the laboratory.

Codonanthe calcarata Hanst. A small thick-leaved woody epiphyte. Frequent in the forest.

RUBIACEAE. Madder Family

Cosmibuena paludicola Standl. Collected near the French lock site, Orchid Island. Apparently rather frequent in the forest, sometimes growing as an epiphyte. The genus is new to the Canal Zone flora.

Macrocnemum glabrescens (Benth.) Wedd. A large tree with corded trunk. Frequent near the laboratory.

Psychotria carthaginensis Jacq. A shrub on Wheeler Trail.

Psychotria hebeclada DC. A shrub. Laboratory clearing.

Randia formosa (Jacq.) Schum. A small tree near the laboratory.

Warscewiczia coccinea (Vahl) Klotzsch. A tree with very showy red bracts. Shore line near Slothia Island.

COMPOSITAE. Aster Family

Baltimora recta L. A sunflower-like weed. French lock site, Orchid Island.

Clibadium surinamense L. A coarse pioneer herb or shrub with small whitish flower heads. Range light clearing.

Melampodium divaricatum (Rich.) DC. A small yellow-flowered herb. French lock site, Orchid Island.

Verbesina myriocephala Schultz Bip. A tall harsh herb with pinnately lobed leaves and white flower heads. Frequent in clearings.

TWO NEW SPECIES OF CHARA FROM TROPICAL AMERICA

M. A. HOWE

In the collection of plants made on Barro Colorado Island, Canal Zone, in 1927 by Prof. Leslie A. Kenoyer is material of a *Chara* which, apparently, has not been described. Its study has involved the investigation of the nomenclature of a South American plant of the same genus, for which no valid name is available. Both these plants are described below.

Chara Kenoyeri M. A. Howe, sp. nov.

PLATE XVI

Dioicous: plants mostly 15-25 cm. high, olive- or sordid-green, very slightly incrusted, flexible; stems 0.8-1.1 mm. in diameter, irregularly and rather loosely triply corticated, the corticated cells often lying at different levels, occasionally the middle zone of the much elongated internodes uncorticated or imperfectly corticated; spine-cells rather few and scattered, or subverticillate in younger parts, flaccid and flexuous, mostly elongate, 0.6-2.7 mm. long, 100-150 μ in diameter at base; stipulodes forming a double whorl at each node, those of the upper whorl reaching a length of 0.6-0.75 mm. and commonly slightly exceeding the uncorticated basal internode of the leaves, those of the lower whorl of about the same length, both occasionally in part deficient (deciduous?); leaves 10-13 in a whorl, 2.5-3.75 cm. long, containing 8-10 internodes, all triply corticated except the basal and one at apex, which are uncorticated, the basal 0.7-0.9 mm. long, 0.35-0.6 mm. broad; leaflets at sterile nodes nearly equal, 1.5-3.7 mm. long, 120-180 μ broad, flexuous; antheridia 0.4-0.6 mm. in diameter; oogonia and sporocarps unknown.

PANAMA: In inlet, Barro Colorado Island, Canal Zone, July 26, 1927, L. A. Kenoyer (type in Herb. N.Y. Bot. Gard.).

In size, light incrustation, and general habit *Chara Kenoyeri* is slightly suggestive of lax conditions of *C. Hornemannii* and *C. Nordhoffiae*, but it is manifestly a member of the "gymnopus" group, with all the leaf-internodes corticated with the exception of the basal and apical. In the "gymnopus" group, the Barro Colorado plant is remarkable by the great length of its leaflets and by being apparently dioicous. The only dioicous species hitherto ascribed

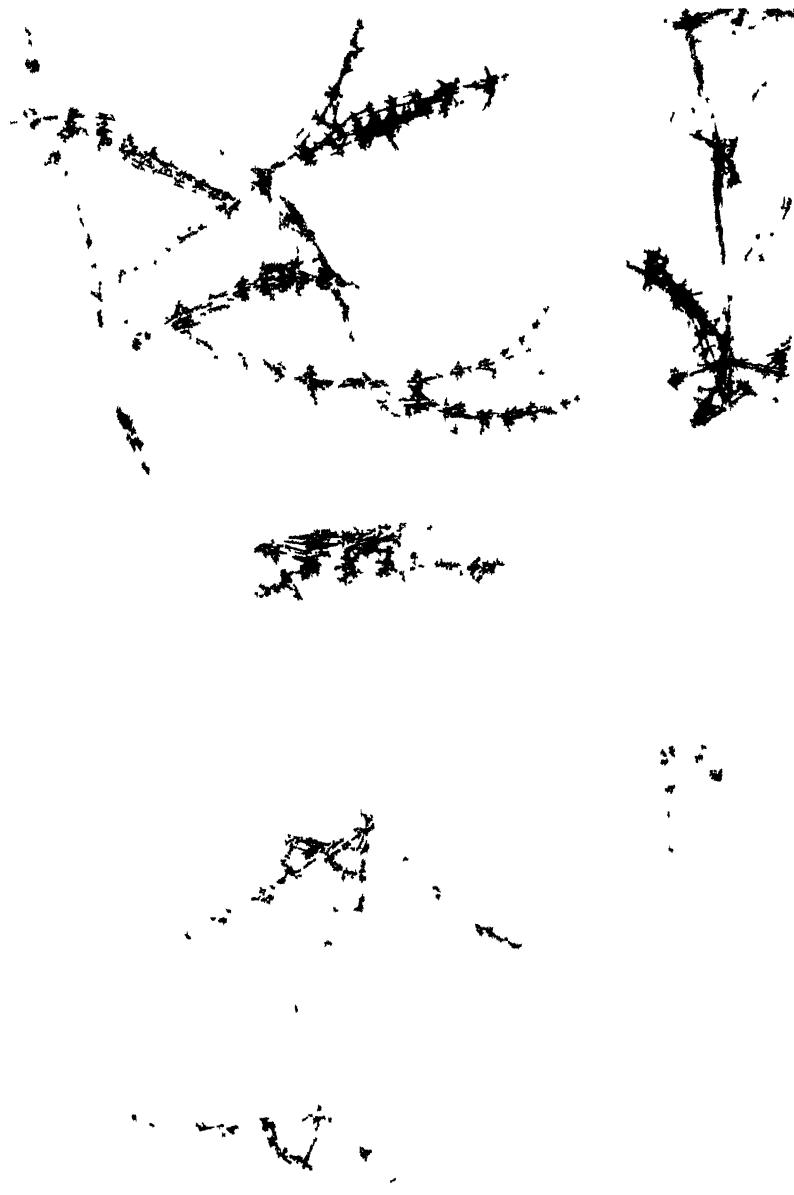
to this group, so far as known to the present writer, is the one to which Braun, in 1847, intended to apply the name *Chara Martiana* and did apply it as a *nomen nudum*,¹ but, unfortunately, before any sort of a description of it was published, Wallman mistakenly diverted the name, with full diagnosis, to a monoicous species, and to this, according to the "American Code" of nomenclature, the name *C. Martiana* legally belongs. Nordstedt has considered the *Chara Martiana* Wallm. non A. Braun to be a synonym of *C. sejuncta* A. Br., but C. B. Robinson (Bull. N. Y. Bot Gard. 4: 276. 1906) has expressed a doubt as to the alleged synonymy. But whether a synonym or not, the American Code demands the renaming of Braun's plant, as has been pointed out by Dr. Robinson. A plant evidently very similar to Braun's and probably of the same species has been collected rather recently by Dr. H. H. Rusby in Bolivia. On the supposition that it is the same as the Brazilian plant of Martius, we are proposing below a new name and framing a new description, based in part on the Bolivian specimens and in part on the Braun-Nordstedt diagnosis of *Chara Martiana* A. Br. We take the precaution of naming the Bolivian plant as the type to carry the new name in case any one should convince himself that the specimens collected by Martius and those collected by Rusby are not conspecific.

Chara Rusbyana M. A. Howe, nom. nov.

Chara Martiana A. Br.; Nordstedt, Fragmente einer Monographie der Characeen von A. Braun 186. pl. 4, f. 97, 98. 1883. Not *C. Martiana* Wallm. Kongl. Vet. Akad. Handl. 1853: 294. 1853.

Dioicous: plant up to 30 cm. high, olive- or gray-green, moderately to strongly incrusted, fragile; stems 0.6-0.85 mm. in diameter, triply corticated; spine-cells scattered or subverticillate, acute and rather rigid, 0.075-0.7 mm. long, 30-50 μ in diameter at base; stipulodes forming a double whorl at each node, those of the upper whorl reaching a length of 0.45-1.68 mm., covering the uncorticated basal internode of the leaves or considerably shorter, those of the lower whorl similar; leaves 10-14 in a whorl, 1.5-3 cm. long, showing 8-13 internodes, all triply corticated except the basal and one (or rarely 2) at apex, which are uncorticated, the basal 0.6-0.9 mm. long, 0.25-0.35 mm. broad, mostly twice as long as broad; leaflets at sterile nodes subequal, 0.16-0.25 mm. long, 50-80 μ broad at base, rather rigid; anterior bracteoles up to 0.45-0.6 mm. long, the lateral and posterior 0.14-0.25 mm. long; antheridian 0.38-0.6 mm. in diameter; sporocarps 0.4-0.68 mm. long, 0.3-0.47 mm. broad, crown cells 35-65 μ high.

¹A. Braun, Uebersicht der Schweizerischen Characeen 23. 1847.



CHARA KENOYERI.

Slightly reduced.

BOLIVIA: At the mouth of the Ingenio River, alt. 3,000 ft., September 28, 1921, H. H. Rusby 692 (Mulford Biological Exploration of the Amazon Basin; type in Herb. N. Y. Bot. Gard.).

Reported also by Braun-Nordstedt, under the name *Chara Martiana* A. Br., from several localities in Brazil (Province of Minas Geraes, Province of Matto Grosso, Province of Piauhy, and in the lake of Algadoes), and from Oran, in the Argentine Republic, near the Bolivian border.

FIELD MUSEUM OF NATURAL HISTORY

FOUNDED BY MARSHALL FIELD, 1893

PUBLICATION 259

BOTANICAL SERIES

VOL. IV, No. 7

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CHICAGO, U. S. A.

July 5, 1929

PRINTED IN THE UNITED STATES OF AMERICA
BY FIELD MUSEUM PRESS

SPERMATOPHYTES, MOSTLY PERUVIAN
FROM THE
CAPTAIN MARSHALL FIELD EXPEDITIONS TO PERU

J. FRANCIS MACBRIDE

I. THE STATUS OF RYNCHOSPORA. SOME PERUVIAN
SEDGES

In considering the South American species of this well-known group of *Cyperaceae* in connection with my own collections from Peru, I was impressed with the similarity of certain members to species of *Dichromena* Michx. Fl. Bor. Am. 1: 37. 1803. On investigation I found that *Rynchospora* Vahl, Enum. 2: 229. 1806 (*Rynchospora* of authors) has frequently been amended to include *Dichromena* and that authors who have maintained both genera have often done so with evident misgivings. It seems sufficient to refer to Bentham and Hooker, Gen. Pl. 3: 1047. 1883 for a résumé of the treatments of authors to that date: Böckeler merged the two genera in 1872, Linnaea 37: 525, and the recent distinguished student of the *Cyperaceae*, Kukenthal, Bot. Jahrb. 56: Beiblatt 125: 16. 1921, followed suit. C. B. Clarke, Urb. Symb. Ant. 2: 99. 1900, kept *Dichromena* but remarked: "Genus a *Rynchospora* Sect. *Psilocarya* non nisi differt spiculis capitatis, saepe stramineis vel cinnamomeis, nuces paucas (1-3) maturantibus; forsitan cum cl. Boeckeler in *Rynchospora* potius mergendum."

Yet this same authority retained in *Rynchospora*, cf. Kew Bull. Misc. Inf. Add. Ser. 8: 117 et seq. 1908, species that exhibit in one or more respects the salient characteristics upon which *Dichromena* has been maintained as a genus, for instance, the characters of few nutlets, or no setae, or simple capitate inflorescence, or presence of foliaceous bracts. Among others mention may be made of *R. Webergaueri* Clarke, maturing 1-3 nutlets, of *R. barbata* (Vahl) Kunth and *R. rigida* (Kunth) Bcklr. with involucrate capitate and pale inflorescences but developed setae, of *R. ebracteata* (Standl.) Pfeiff. with

bracts reduced to subobscurity but in other respects with the characters of *Dichromena*. The list could be extended of species such as these that collectively at least show a dovetailing of all characters upon which *Dichromena* has rested.

These "connecting" species are all tropical American: the botanist writing on an area outside their range might well find it convenient for himself and for his readers to recognize both genera, for there, in aspect alone, they seem different enough. But from the standpoint of sound taxonomy, all species considered, there is only one generic concept, for which the proper name is *Dichromena*. *Rynchospora* stands as a *conserved* name only for those who regard it as distinct from *Dichromena*.

Probably the segregate genus *Pleurostachya* Brongn. should also be included in *Dichromena*. It was regarded as a section only of *Rynchospora* by Bentham and Hooker. There is an excellent review of these and allied genera by Pfeiffer, Rep. Spec. Nov. 23: 342. 1927, and his synopsis of the characters shows clearly their relative distinctness, and the weakness of the particular segregates considered here.

The following species have been recorded as growing in Peru with the exception of the first, which is cited as a representative North Temperate species of the Section *Rynchospora*.

Dichromena alba (L.), comb. nov. *Schoenus albus* L. Sp. Pl. 44. 1753. *Rynchospora alba* (L.) Vahl, Enum. 2: 236. 1806.

Dichromena alta (Bcklr.), comb. nov. *Rynchospora globosa* (HBK.) R. & S. Syst. 2: 89. 1817, not *D. globosa* (HBK.) R & S., l.c. 90. *Chaetospora globosa* HBK. Nov. Gen. and Sp. 1: 230. 1815. *Rynchospora alta* Bcklr. Cyp. Nov. Heft 2: 20. 1890, acc. Clarke.

DICHROMENA BLEPHAROPHORA Presl, Rel. Haenk. 1: 351. 1830. *D. ciliata* Presl, l.c. 197, t. 32, f. 2, 1828, not Vahl.

DICHROMENA BRUNNEA Bcklr. Linnaea, 37: 593. 1873.

DICHROMENA CILIATA Vahl, Enum. 2: 240. 1806.

DICHROMENA DISSITIFLORA Steud. ex Bcklr. Linnaea, 37: 598. 1873

Dichromena glauca (Vahl), comb. nov. *Rynchospora glauca* Vahl, Enum. 2: 233. 1806. *Rynchospora ferruginea* (HBK.) R. & S Syst. 2: 85. 1817.

DICHROMENA GLOBOSA (HBK.) R.&S. Syst. 2: 90. 1817. *Schoenus globosus* HBK. Nov. Gen. and Sp. 1: 229. 1815.

If I may judge from a specimen of André referred here, from near Vista, Nov. Granat., this species differs from *D. ciliata* as indicated by HBK. and appears to merit recognition, although reduced by Clarke; Urb. Symb. Ant. 2: 101. 1900.

Dichromena Kükenthalii (Pfeiff.), comb. nov. *Rynchospora Kükenthalii* Pfeiff. Rep. Spec. Nov. 17: 237. 1921. *R. Uleana* Kükenth. Bot. Jahrb. 56: Beibl. 125: 17. 1921, not Beckr. Allg. Bot. Zeit. 2: 110. 1896.

Dichromena Lechleri (Steud.), comb. nov. *Rynchospora Lechleri* Steud. ex Beckr. Linnaea, 37: 633. 1873.

Dichromena macrochaeta (Steud.), comb. nov. *Rynchospora macrochaeta* Steud. ex Beckr. Linnaea, 37: 632. 1873.

Dichromena Mandonii (Clarke), comb. nov. *Rynchospora Mandonii* Clarke, Kew Bull. Add. Ser. 8: 38. 1908.

Dichromena polyphylla (Vahl), comb. nov. *Rynchospora polyphylla* Vahl, Enum. 2: 230. 1806. *Schoenus polyphyllus* Vahl, Eclog. Amer. 2: 5. 1798.

DICHROMENA PULCHELLA Poepp. & Kth. in Kunth, Enum. 2: 277. 1837.

DICHROMENA RADICANS Schl. & Cham. Linnaea, 6: 28. 1831.

Dichromena Ruiziana (Bcklr.), comb. nov. *Rynchospora Ruiziana* Bcklr. Linnaea, 37: 641. 1873.

DICHROMENA RUIZIANA (Bcklr.) Macbr., var. *triceps* (Bcklr.), comb. nov. *Rynchospora triceps* Bcklr. Linnaea, 37: 642. 1873. *R. Ruiziana* Bcklr., var. *triceps* K. Schum. ex Clarke in Urb. Symb. Ant. 2: 115. 1900.

Dichromena semiinvoluta (Presl), comb. nov. *Rynchospora semiinvoluta* Presl, Rel. Haenk. 1: 198. 1830.

Dichromena umbraticola (Poepp. & Kth.), comb. nov. *Rynchospora umbraticola* Poepp. & Kth. in Kunth, Enum. 2: 300. 1837.

Dichromena Weberbaueri (Clarke), comb. nov. *Rynchospora Weberbaueri* Clarke, Bot. Jahrb. 37: 518. 1906.

Cyperus Schraderi, nom. nov. C. *Martianus* Schrad. ex Nees in Mart. Fl. Bras. 2¹: 32. 1842, not Schult. Mant. 2: 108. 1824.

According to Weberbaur, Veg. der Erde 12: 238. 1911, this Brazilian species has been found in southern Peru, Valley of Sandia, Dept. of Puno.

Stenophyllum arenarius (Nees), comb. nov. *Isolepis arenaria* Nees, Linnaea 9: 291. 1834. *Bulbostylis arenaria* (Nees) Lindm. Bihang K. Sv. Vet. Akad. Handl. 26, Afd. 3, No. 9. 19. 1900. *Stenophyllum tenuifolius* (Rudge) Britton, var. *latesquamata* Pfeiff. Bot. Archiv 6: 189, 193. 1924.

There seems to be good precedent for regarding this as a species. Although it may be closely related to *S. tenuifolius*, its suborbicular scales are suggestive of those of *S. scaber*. Originally Brazilian, it is now known from the Departments of Ancash and Junin, Peru.

STENOPHYLLUS CAPILLARIS (L.) Britton, var. *ciliatus* (Presl), comb. nov. *Stenophyllum eu-capillaris ciliata* (Presl) Pfeiff. Bot. Archiv 6: 187, 193. 1924.

Originally collected near Huanuco, Peru, by Presl and apparently not recollected in Peru, this plant seems to be better known in Brazil.

Scleria spicata (Spreng.), comb. nov. *Rhynchospora spicata* Spreng. Syst. 1: 194. 1825. *Scleria pleostachya* Kunth, Enum. 2: 355. 1837.

According to Weberbaur this Brazilian species has been found in the Sandia Valley, Dept. of Puno, Peru.

2. NEW CAPERS FROM PERU

Gynandropsis Herrerae, spec. nov., annua, herbacea, simplex subglabra vel ubique minutissime pulverulento-pubescent; caulis circa 3 dm. altis; foliis intermediis summisque ternatis, petiolis gracilibus striatis 4-7 cm. longis; foliolis petiolatis ovatis vel ovato-lanceolatis basi cuneatis mediocriter obliquis inaequalibus, apice plus minusve abrupte acutis vel acuminatis submembranaceis plerumque 6-8 cm. longis, 2.5-3 cm. latis; racemis laxifloris ebracteatis vel bracteis caducissimis; pedicellis fructiferis refracto-patentissimis circa 2 cm. longis; laciinis calycinis ovatis acutis circa 3 mm. longis; petalis 10-12 mm. longis, lamina elliptico-spathulata, ungue subaequilongo; staminibus nonnihil vel vix corollam excedentibus; toro incluso tantum 7 mm. longo; siliqua (nondum perfecte matura) lineari-cylindracea utrinque acuta circa 6 cm. longa, thecaphorum pedicello duplo brevius.—PERU: forest, alt. 2—2300 m., near Rio Yanamayo, below "Pillahuata," Dept. of Cuzco, May, 1925, Francis W. Pennell 14073 (TYPE, Field Museum).

This species is entirely different from any so far recorded from Peru and apparently has no known close relative. The collector recorded the flower as "flesh ocher" in color. It is named for Dr Herrera of the University of Cuzco, the distinguished authority on the plants of the region.

Cleome Figueroae, spec. nov., inermis, subherbacea vel suffrutescens; caulis striatis subsimplicibus 1-1.5 m. altis glabris vel obscure subadpresso strigillosis; foliis 5-7-sectis utrinque minute pubescentibus cum pilis crispulis vel hispidulis subtus pallidioribus et nervis prominente purpurascientibus; petiolis 8-10 cm. longis plus minusve strigillosis etiamque cum pilis longioribus parce intermixtis vel subpilosis imprimis ad apicem; foliolis petiolatis ovato-lanceolatis utrinque acuminatis 5-8 cm. longis 1.5-3 cm. latis; racemis elongatis (2.5 dm. plus minusve); bracteis simplicibus suborbiculari-cordatis aliquid scabris; sepalis rotundo-ovatis acutis vix 5 mm. longis; petalis oblongo-ellipticis fere 2 cm. longis; pedicellis fructiferis subreflexis circa 2 cm. longis; siliquis (immaturis) glabris lineari-cylindraceis obscure torulosis circa 6 cm. longis, longe stipitatis; stipes 8 cm. longis.—PERU: Huacachi, near Muña, Dept. of Huanuco, May 20-June 1, 1923, Macbride 4173 (TYPE, Field Museum).

Probably this species most resembles *C. longifolia* Presl which, however, is described as having lanceolate acuminate sepals and much shorter (4 cm. long) pods. It is named for Reyes Figueroa of Mito, Peru, in recognition of his loyalty and interest while serving as guide on the Captain Marshall Field Botanical Expeditions of 1922 and 1923.

Cleome Herrerae, spec. nov., ut videtur peraffinis *C. longifolia*; caulis, foliis subtus, petiolisque plus minusve strigillossis; sepalis ovato-lanceolatis, basi haud attenuatis, apice sensim subacuminatis, dense subadpresso strigillossis, 6-7 mm. longis; petalis oblongo-lanceolatis, basi anguste attenuatis, circa 17 mm. longis; ovario glabro; pedicellis fructiferis solum 1.5 cm. longis; siliquis (immaturis) circa 5 cm. longis; stipes 3.5 cm. longis.—PERU: Valle de San Miguel, Cedrobamba, Dept. of Cuzco, 20 de Julio de 1928, F. L. Herrera 1992 (TYPE, Field Museum).

C. longifolia Presl, Rel. Haenk. 2: 84. 1831, the only Peruvian species to which this beautiful Cleome is closely related, is described as having sepals that are attenuate at the base, petals about 12 mm. long, pedicels 2.5 cm. long and pods about 4 cm. long. It does not seem desirable at this time to regard these differences, definite as they are, as representing merely a variation of this species. Dr. Herrera reports the common name as "Facma."

Cleome limoneolens, spec. nov., *C. chilensis* peraffinis; basi indurato-suffrutescens vel fruticosa, ramosa; caulis aliquot dm. altis adscendentibus flexuosis mediocriter basi ad apicem dense sordide glanduloso-pubescentibus cum pilis hirsutulis vel crispulis; foliis 5-7-foliolatis utrinque granuloso-glandulosis vel paullo scabridis; petalis tantum 5-6 mm. longis.—PERU: loose soils of river-cañon slopes, San Rafael, Dept. of Junin. April 4, 1923, Macbride 3145 (TYPE, Field Museum); steep rocky grassland, Huacachi, near Muña, Dept. of Huanuco, May 20-June 1, 1923, Macbride 4088.

This may prove to be only a variety of *C. chilensis* DC., which is not uncommon in Peru, but no intermediate plants have been seen. Its shrubby base and small flowers seem, therefore, to be distinctive characters. The plants were noticeably lemon-scented.

Cleome monochroma, spec. nov., subherbacea stricta haud ramosa aliquot dm. (vel 1 m.?) alta; caulis minute pulverulentis fere basi ad apicem vel plus minusve villosis et parce cum glandulis stipitatis glanduliferis imprimis parti superiori; foliis membranaceis longi-petiolatis (petiolis circa 1.5 dm. longis) 7-foliolatis utrinque molliter subadpresso strigillossis; foliolis oblongo-ellipticis vel oblongo-lanceolatis utrinque attenuatis,—apice acuminatis basi extenuato-cuneatis—sessilibus plerumque circa 8-12 cm. longis 2-3.5 latis;

floribus 4 cm. longis plus minusve villosis et parce glandulosis ut videtur sepalis petalisque albo-viridibus; sepalis anguste linear-acuminatis 2-2.5 cm. longis; petalis paullo latioribus subobtusis; pedicellis fructiferis 4-5 cm. longis; stipes 5-6 cm. longis siliquis obscure puberulis pendulis vel suberectis anguste oblongo-cylindraceis 10-14 cm. longis fere 1 cm. latis basi subacutis apice acuminatis.—PERU: sandy trail edge, La Merced, Dept. of Junin, Aug. 10-24, 1923, Macbride 5386 (TYPE, Field Museum). COLOMBIA: Rio de la Honda near Arbelaez, Feb. 19, 1876, Ed. André 1589. MEXICO: Misantla, Vera Cruz, Aug., 1912, Purpus 5873.

No Peruvian species resembles this unusually well-marked Cleome. Its strict habit, large greenish flowers with linear sepals and petals, and long oblong-clavate pods are characteristics that combined make it most distinctive. Yet I have not been able to find a name for it—and the material cited from Colombia and Mexico was distributed unnamed.

Cleome eosina, n. nov. *C. microcarpa* Hass. Rep. Spec. Nov. 12: 254. 1913, not *C. microcarpa* Ule, Bot. Jahrb. 42: 201. 1908.

Since there is already a *Cleome Hassleriana* this Paraguayan species may be called *eosina* as it suggested to its author several species, *C. affinis* DC., *C. diffusa* Banks and *C. aculeata* L.

Capparis Schunkei, spec. nov., arbor parva; ramulis glabris; foliis submembranaceis fortiter reticulato-venosis ellipticis vel oblongo-ellipticis plerumque circa 15 cm. longis et 5 vel 6 cm. latis, apice subabrupte breviter acuminatis basi subcuneatis, petiolatis (petiolis circa 1.5 cm. longis), supra glabris (vel juventute minute stellato-pubescentibus) lucidis, subtus ramulisque inflorescentiis obscure subferrugineo-stellato-pubescentibus; racemis ramosis aliquid paniculatis foliis brevioribus paucifloris; pedicellis gracilibus 1.5-2 cm. longis; bracteis minutis caducissimis; calycibus petalisque mediocriter externe fulvo-pubescentibus cum pilis stellatis; sepalis oblongo-lanceolatis subacutis reflexis 3 mm. longis; squamulis circa 1 mm. longis; petalis late ovatis subobtusis 5 mm. longis; staminibus circa 20 pistilloque longe exsertis; ovario ovoideo glabro.—PERU: Chanchamayo Valley, Dept. of Junin, 1924-1927, Carlos Schunke 418 (TYPE, Field Museum); Hacienda Schunke, La Merced, Macbride 5701.

No species of the subgenus *Colicodendron*—to which this plant belongs—appears to approach *C. Schunkei* except possibly *C. lepidota* (Turcz.) Knuth of Venezuela from which it differs in character of pubescence, shape of leaves and number of stamens. In foliage only it suggests two glabrous Peruvian species, *C. laurina* HBK. and *C. Sprucei* Eichl. both of which, however, belong in another subgenus.

C. Schunkei is a small tree with spreading branches and pale greenish-yellow flowers. It is named with pleasure for the collector whose hospitality I enjoyed when on the Captain Marshall Field Botanical Expedition to Peru in 1923.

3. SOME PERUVIAN ANNONACEAE WITH A NEW GUATTERIA

Guatteria Rusbyi, nom. nov. *G. lucida* Rusby, Mem. N. Y. Bot. Gard. 7: 245. 1927, not *G. lucida* Presl, Rel. Haenk. 2: 78. 1831.

This recently described species from Bolivia may appropriately bear the name of the author who evidently overlooked the much earlier use of the term *lucida* for a distinct Peruvian species.

Guatteria pachypetala (Diels), comb. nov. *Oxandra pachypetala* Diels, Notizb. 10: 173. 1927.

If one may judge from the original characterization, this Peruvian tree is a *Guatteria* rather than an *Oxandra* because it has "stamina numerosa" and "connectivum vix productum." According to all authorities, even including Engler and Diels, Notizb. 3: 49. 1900, *Oxandra* has few (6-18) stamens and the connective is produced above the anther. If these characters do not "hold," *Oxandra* can hardly be maintained as a distinct genus.

Guatteria socialis, spec. nov., liana; ramulis folisque glabris; foliorum petiolo prope 1 cm. longo supra nonnihil sulcato crasso, lamina chartacea oblongo-vel ovato-elliptica plerumque circa 15 cm. longa 4-7 cm. lata utrinque sensim angustata vel apice subabrupte acuminata (acumine subobtusato) supra pallide-glauca nitidula subtus viridi-nitidiore, nervis lateralibus primariis utrinque 9-11 angulo acuto adscendentibus sub prominulis, venis reticulatis prominulis; pedunculis glabris solitariis axillaribus subgracilibus 2.5-3 cm. longis, basi squamuoso-bracteolatis vix articulatis vel medio quandoque unibracteolatis; bracteolis minute ciliatis; sepalis orbiculari-ovatis subacutis solum minutissime ciliatis; petalis glabris ut videtur subaequalibus subovatis vel oblongo-ellipticis circa 12 mm. longis, 6-8 mm. latis; baccis ignotis.—PERU: Dept. Junin, Chanchamayo Valley, 1500 m., Oct. 1924-27, Carlos Schunke 395 (TYPE, Field Museum).

This was noted in the field by the observant collector to be a liana and apparently is only the second scandent *Guatteria* to be recorded. *G. scandens* Ducke has pubescent flowers. Dr. Diels has described a climbing *Annona* (*A. scandens* Diels). In addition to the habit this species seems to differ in size and shape of leaves, elongate

peduncles, etc., from the comparatively few Guatterias with completely glabrous foliage and flowers. Its relationship may be with *G. jurensis* Diels.

Fusaea rhombipetala (R. & P.), comb. nov. *Anona rhombipetala* R. & P. ex G. Don, Gard. Dict. 1: 87. 1831.

Safford has recently established the genus *Fusaea*, Contrib. U. S. Nat. Herb. 18: 64. 1914, and evidently for the most excellent reasons. He has also indicated that the Peruvian species cited above is in fact a *Fusaea* rather than an *Annona* but he did not make the transfer.

Duguettia odorata (Diels), comb. nov. *Aberemoa odorata* Diels, Notizb. 10: 171. 1927.

Duguettia pedunculata (Diels), comb. nov. *Aberemoa pedunculata* Diels, Bot. Jahrb. 37: 409. 1906.

Duguettia peruviana (R. E. Fries), comb. nov. *Aberemoa peruviana* R. E. Fries, Kgl. Sv. Vet. Akad. Handl. 34, no. 5: 22, pl. 3, fig. 1-3. 1900.

Duguettia St. Hil. Fl. Braz. Mer. 1: 35. pl. 7. 1825 is "conserved" according to the International Rules of Botanical Nomenclature in place of *Aberemoa* Aubl. Pl. Guian. 1: 610. 1775. There seems always to have been some question, however, as to the generic identity of Aublet's plants with St. Hilaire's, and Safford has recently pointed out (Contrib. U. S. Nat. Herb. 18: 60-61. 1914) that they can scarcely be congeneric. The use of the name *Aberemoa*, therefore, should remain restricted to the original and very imperfectly known species *A. guianensis* Aubl.

4. NEW AND RENAMED PERUVIAN MELASTOMES

Ernestia Sprucei (Cogn.), comb. nov. *E. tenella* (Bonpl.) DC., var. *Sprucei* Cogn. Bull. Acad. Belg. 3. 14: 929. 1887.

Cogniaux described this plant, to distinguish it from typical *E. tenella*, as a branched shrub 1.5-2 m. high with purple flowers and densely setose (at apex) ovary. These characters seem to me specific: *E. tenella* is subherbaceous or woody below, 0.5 m. high and has white flowers and a scarcely puberulent ovary.

Brachyotum callosum, spec. nov., fruticosum 0.5-1.5 m. altum, dense ramosissimum; ramis teretibus flexuosis adpresso setulosis inferne demum glabratis; ramulis dense subadpresso setulosis plerumque 1 dm. longis; foliis valde approximatis 3-nerviis oblongo-

ellipticis utrinque obtusis 8-10 mm. longis, 4-5 mm. latis subplanis vel mediocriter revolutis; petiolis (circa 1 mm. longis) foliisque subtus adpresso dense setulosis, supra callis conicis apice breviter setiferis dense onustis; floribus pedunculatis plerumque ternis 5-meris (semper?) breviter pedicellatis; bracteis tarde deciduis; calycis tubo conico vel anguste campanulato parce adpresso strigoso circa 8 mm. longo, lobis triangulari-ovatis acutis circa 5 mm. longis; petalis late obovatis circa 12 mm. longis plus minusve breviter ciliatis; antheris oblongo-linearibus, connectivo brevissime elongato *non* tuberculato.—PERU: in scattering hillside thickets, 15 miles northeast of Huanuco, June 12-22, 1922, *Macbride & Featherstone* 2181 (TYPE, Field Museum).

This species is a member of the section *Adesmiae* and apparently is most nearly related to *B. Trianaei* Cogn. Melast. 167. 1891, notwithstanding its 5-merous flowers. It can be distinguished from Cogniaux's plant by the entirely different pubescence of the leaves and calyx. In some respects it resembles both *B. lutescens* (R. & P.) Triana and *B. microphyllum* Triana but the pubescence of the former is hispid and strigose and that of the latter sparsely strigose and setulose. In most if not all species of *Brachyotum* the flowers may be either 4- or 5-merous. For instance, *B. lutescens* was described as sometimes 5-merous and so are my Peruvian specimens. *B. callosum* therefore will probably be found to vary in the same way. Its flowers (apparently yellowish) were not fully grown so the petals may become longer than described.

Brachyotum Figueroae, spec. nov., fruticosum, circa 1 m altum; ramis gracilibus tarde glabratris ut videtur 2-3 dm. longis; ramulis mediocriter approximatis plerumque 1 dm. longis dense subadpresso que hirsuto-setulosis; petiolis foliisque subtus dense hirsutis, foliis supra crassis conicis apice scutiferis dense tuberculatis, late ovatis subplanis circa 9 mm. longis, 5-6 mm. latis; floribus breviter pedunculatis solitariis vel 3-4, 4- vel 5-meris; calycis rubescensibus sparse setulosis, tubo plus minusve anguste campanulato circa 1 cm. longo, lobis ovatis circa 4 mm. longis; petiolis rotundato-obovatis breviter ciliatis circa 12 mm. longis; connectivo non producto antice brevissime 2-tuberculato.—PERU: stream bank, Catuc, pueblo 15 miles east of Huaraz, Dept. of Ancash, Oct. 4, 1922, *Macbride & Featherstone* 2504 (TYPE, Field Museum).

Only two other species of the section *Dicentrae* seem to be closely related to this, namely *B. Maximowiczii* Cogn. and *B. rosmarinifolium* (R. & P.) Triana. *B. Figueroae* may be distinguished from the former of these by its much shorter calyx-lobes in proportion to the tube and whitish flowers, and from the latter by the broadly ovate leaves that are hirsute rather than setulose beneath, as well as by the color

of the flowers and proportionately shorter calyx-lobes. It is named for Reyes Figueroa, my helpful companion on many collecting journeys in 1922 and 1923.

Brachyotum tyrianthinum, spec. nov., fruticosum, 1-2 m. altum, solum mediocriter ramosum; ramis gracilibus glabris paullo vel haud excoriatis; ramulis petiolis foliisque supra plus minusve dense adpresso setulosis; petiolis circa 3 mm. longis; foliis ovatis plerumque 2 cm. longis et circa 1 cm. latis, 3-nerviis, subtus parce hirtello-setulosis; floribus solitariis cernuis 4-meris (semper?) violaceo-purpureis; calycis tubo adpresso setulosis campanulato 7 mm. longo, lobis parce setulosis oblongo-lanceolatis circa 1 cm. longis; petalis subrotundato circa 15 mm. longis minute ciliatis; connectivo obscure vel breviter tuberculato.—PERU: slender rather open bush on shrubby southwestern slope, Mito, Dept. of Huanuco, July 8-22, 1922, *Macbride & Featherstone* 1438 (TYPE, Field Museum).

This species, definitely referable to the section *Dicentrae*, apparently resembles both *B. Grisebachii* Cogn. and *B. Naudinii* Triana. It differs from the former in its ovate rather than oblong leaves and in its shorter and broader petals. The longer leaves and calyx-lobes and rounded petals separate it from the latter. The pubescence on the upper leaf-surfaces is peculiar in that each bristle emanates from an elongate callous that scarcely exceeds the bristle in width and is attached to or is a part of the leaf-surface.

TIBOUCHINA LONGIFOLIA (Vahl) Baill., var. **simulans**, var. nov., foliis interdum 7-nerviis; sepalis plus minusve setoso-glandulosis; petalis basi ad apicem valde ciliatis; connectivo basi breviter pro-ducto.—PERU: La Merced, Dept. of Junin, Aug. 10-24, 1923, *Macbride* 5300 (TYPE, Field Museum); Pozuzo, Dept. of Huanuco, June 10-22, 1923, *Macbride* 4556.

I should be inclined to describe this variant as a new species were it not for the apparent variability of *T. longifolia* and the fact that the numerous segregates based on relative length of connective and character and degree of pubescence when better known will very likely be found to represent extremes only in different directions of variation. The above variety resembles also *T. stenopetala* Cogn. except that the petals are not narrowed at base.

Tibouchina pleromoides (Naud.), comb. nov. *Lasiandra pleromoides* Naud. Ann. Sci. Nat. 3: 131. 1850. *Pleroma maurocarpum* Triana, Trans. Linn. Soc. 28: 47. 1871. *Tibouchina maurocarpa* (Triana) Cogn. Melast. 260. 1891.

Aciotis cordata (Vell.), comb. nov. *Melastoma cordata* Vell. Fl. Flum. 178. 1825 et Ic. 4: tab. 114. 1827. *Spennera dysophylla* Benth. Journ. Bot. 2: 296. 1840. *Aciotis dysophylla* (Benth.) Triana, Trans. Linn. Soc. 28: 52. 1871.

Triana, l.c.151, refers the plant of Velloso to that of Benthham without question and as it is the earlier known its name may be used.

Monochaetum canescens (Bonpl.), comb. nov. *Rhexia canescens* Bonpl. Rhex. 47. tab. 18. 1823. *R. Bonplandii* Kunth in index, Rhex. *M. Bonplandii* (Kunth) Naud. Ann. Sci. Nat. 3. 4: 51. tab. 2. f. 1B. 1845.

Monochaetum subditivum, spec. nov., *M. dicranantherum* peraffine; petiolis plerumque 8-10 mm. longis; foliis anguste ovatis 3-4 cm. longis circa 1.5 cm. latis, apice mediocriter attenuato-acutis, 5-plinerviis; cymis axillaribusque terminalibus, 2-4-floris; calyx setis patulis elongatis plerumque glandulosis hirsuto; lobis oblongo-lanceolatis definite acutis; staminibus minoribus caudatis caudis linearibus antheris paullo brevioribus.—PERU: an open 3-4 ft. shrub of montaña slopes. Villcabamba, hacienda on Rio Chinchao, Dept. of Huanuco, July 12-26, 1923, Macbride 5194 (TYPE, Field Museum).

This typical species of *Monochaetum* on casual observation would readily pass for *M. dicranantherum* (R. & P.) Naud. but careful examination discloses a number of differences that make its reference to the latter unsatisfactory. The calyx-hairs are nearly all tipped with a gland; otherwise the pubescence is exactly that of *M. dicranantherum*. Also the leaves are longer and more gradually acute, and the appendage of the smaller anthers almost equals the anther in length. These differences may be found to be relative but at present there is no evidence to this effect.

M. subditivum bears some resemblance to *M. villosum* Gleason, Bull. Torr. Club, 52: 335, but the leaf-pubescecence of the latter is evenly distributed over the upper surfaces. In both *M. dicranantherum* and the species proposed here it is confined to lines between the veins. There is also a difference in the relative size of the smaller anthers and their appendages. Two other species that are related are at once distinct because of their 7-nerved leaves, namely *M. pauciflorum* Triana and *M. glanduliferum* Triana.

Marshallfieldia, gen. nov. Flores 5-meri. Calycis tubus infundibulariformi-campanulatus; limbus brevis, haud dilatatus, subsimplex, lobis rotundatis. Stamina valde inaequalia filamentis distincte alatis; maiorum antherae tenues, apice arcuatae, anguste uniporosae;

minorum antherae haud rostratae, obtusae, rectiae. Connectivo infra loculus non producto, antice inappendiculato, postice processu elongato fere erecto apice biaristato instructo. Ovarium liberum.—Frutices scandentes vel ut videtur sarmentosi vel pseudoparasitici. Folia petiolata, 5 nervia. Flores mediocres, in racemos (vel paniculas?) paucifloros terminales depositi.—Affinis videtur *Merianiae*.

Marshallfieldia corallina, spec. nov., scandens; ut videtur caule indiviso flexuoso dense rufo-villoso; foliis late ovalibus vel rotundis, basi rotundatis, apicem versus sensim angustatis, acutis, membranaceis, supra primo leviter villosis imprimis ad nervos demum glaberrimis, subtus mediocriter dense rufo-pilosis praecipue ad nervos, circa 11 cm. longis et 8 cm. latis; petiolis etiam dense rufo-villosis, 2-2.5 cm. longis; floribus 2 vel 3, breviter pedicellatis ad apicem ramorum subcongestis; calycis tubo parce adpresse villoso-setosis vel subglabris, basin versus cuneatim angustato, angusto, circa 5 mm. longo, limbo non dilatato, lobis rotundatis, abrupte acutis, margine tenuiter membranaceis minute serrulatis, circa 1.5 mm. longis; petalis oblongo-ovatis, circa 12 mm. longis, 6 mm. latis; staminibus valde inaequalibus; filamenta maiorum 9 mm. longa, antherae fere 8 mm. longae, appendices circa 3 mm. longae; minorum filamenta fere 11 mm. longa, antherae et appendices 4.5 mm. longae; ovario glabro, stylo 8 mm. longo.—PERU: climbing a tree-trunk, Hacienda Schunke, La Merced, Dept. of Junin, Aug. 27-Sept. 1, 1923, Macbride 5642 (TYPE, Field Museum).

This interesting new genus of the *Melastomaceae* was collected on the second of the botanical expeditions to Peru sponsored by Captain Marshall Field. It is an attractive plant with creeping stem and somewhat fan-shaped leaves densely covered on the under side with soft rusty-red hairs. The upper leaf-surface is dark green and smooth. The flowers are a coral-pink with yellow anthers.

Marshallfieldia is not satisfactorily referable to any of the tribes of its family as these have been characterized by Cogniaux in his monograph, *Melast.* 1891. Although only flowering material is known it appears to be allied to the *Merianiae* in which, however, there are no genera with very unequal stamens. Notwithstanding the unequal stamens its generic relationship is apparently with *Adelobotrys* which it resembles in habit and foliage and exactly matches in character of the anther-appendages but its calyx is lobed like that of some species of *Meriania*.

Meriania Weberbaueri, spec. nov., arbor 8 m. alta; ramis ad nodos satis incrassatis plus minusve obscure tetragonis dense furfuraceo-puberulis vel demum fere glabris; foliis late ovalibus vel elliptico-ovatis, obtusis, basi aliiquid attenuatis, margine inferne integerrimis superne valde repando-serrulatis, circa 2 dm. longis,

1 dm. latis (superioribus multo reductis) submembranaceis supra glabris, subtus minute denseque pubescentibus cum pilis stellatis et pilosis intermixtis, 7-plinerviis; nervis mediocriter prominentibus; nervulis transversalibus subtus tenuissime ramuloso-reticulatis; cymis paucifloris; calycis lobi triangulares, tubo aequales vel longiores, dentibus exterioribus vix 3 mm. longis; tubo dense furfuraceo-puberulis, campanulato 6 mm. longo, superne 8 mm. lato, obscure costato distincte tuberculato, limbo haud dilatato; petalis roseis late obovatis circa 2 cm. longis; staminibus magnis, antheris valvis valde crispato-undulatis, connectivo basi valde incrassato, in appendicem brevem minute bilobatam producto.—PERU: valley of the Rio Masamerich, tributary of the Rio Pangao, Dept. of Junin, May 7, 1913, Weberbauer 6659 (TYPE, Field Museum).

This beautiful species, although clearly a member of the section *Umbellatae*, is not closely related to any of the known species. Its stamens resemble most those of the otherwise entirely different *M. speciosa* (Bonpl.) Naud. except that the shorter appendages are shortly bilobed instead of acute and hooked.

Macrocentrum peruvianum (Cogn.), comb. nov. *M. fasciculatum* (DC.) Cogn., var. *peruvianum* Cogn. Bot. Jahrb. 42: 138. 1908.

This simple-stemmed procumbent plant with fruiting calyces nearly 1.5 cm. long can scarcely be regarded as only a variety of *M. fasciculatum* (DC.) Cogn. which is known only from French Guiana and is an erect branched herb with much longer petioles and leaves and much shorter—only 6 mm. long—fruiting calyx.

Tococa undabunda, spec. nov., fruticosa circa 1.5 m. alta, macrophylla, anisophylla; ramis subteretiusculis plus minusve setulosis demum glabris; ramulis flexuosis petiolisque undique dense setulosis, setis elongatis, rigidis, patentibus; foliis longe petiolatis, elliptico-ovatis basi subrotundatis vel quandoque leviter attenuatis apice subabrupte attenuato-acuminatis vel caudatis, margine obscure undulatis et longiuscule satis denseque ciliatis, 5-nerviis, supra parce subadpresso setulosis subtus ad nervos subdense hirtellis caeterum glabris, majoribus plerumque 2-2.5 dm. longis et 1-1.4 dm. latis, in petiolo vesciculiferis, minoribus aliquando vescicula destitutis; vesicis ut videtur ovoideis; nerviis subtus et supra prominentibus, nervulis transversalibus ubique insigne undulatis, subtus ramuloso-reticulatis; petiolo (in foliis majoribus) 5 vel 6 cm. longo; capitulis terminalibus circa 30- vel 40-floris breviter pedunculatis; floribus sessilibus ebracteolatis; calyce inferne papilloso, superne parce setuloso, tubo oblongo-campanulato circa 5 mm. longo distincte 5-lobato, lobis late ovatis longe setulosis; petala ut videtur alba, immatura.—PERU: open shrub of montaña slope, Hacienda Schunke, La Merced, Dept. of Junin, Aug. 27-Sept. 1, 1923, Macbride 5734 (TYPE, Field Museum).

Only a few species of *Tococa* have sessile flowers borne in a capitate inflorescence. Of these *T. undabunda* most suggests *T. spadiciflora* Triana, Trans. Linn. Soc. 28: 132. 1871 because of the position of the vesicles on the petioles although that species has 5-plinerved leaves and bracteate flowers. If the occurrence of vesicles is disregarded our plant appears to be more nearly related to other species from all of which it is readily distinguished by characters of pubescence, leaves, petioles and calyx. The calyx-pubescece was pink. Sometimes but not usually the leaves beneath the inflorescence are greatly reduced to nearly linear long-acuminate bracts. The name refers to the flexuous branchlets, wavy leaf-margins and cross-veins.

Blakea Sawadae, spec. nov., fruticosa 2 m. alta; ramis teretibus vel obtuse subtetragonis; foliis 5-nerviis oblongo-vel ovato-ellipticis, basi plus minusve acutis, apice subacutis et abrupte caudato-acuminatis, plerumque 1.5 dm. longis et 7 vel 8 cm. latis, mediocriter coriaceis, supra glabris sub lente minute denseque puncticulatis, subtus ad nervos nervulosque leviter furfuraceis, caeteris glabris; petiolis robustis vix furfuraceis 2-3 cm. longis; floribus 2-4-fasciculatis subsessilibus 3 cm. latis; pedicellis 2-5 mm. longis; bracteis valde inaequalibus, exterioribus base definite connatis, dense furfuraceis ovatis longe acutis inferne dorso carinatis, 1-1.5 cm. longis, interioribus subrotundatis fere glabris vel satis furfuraceis setoso-ciliatis circa 1 cm. longis; calyce subglabro 12-17 mm. longo, tubo campanulato, limbo regulariter 6-lobato, lobis ovatis apice dilatatis subobtusis; petalis albis subrotundalis circa 1 cm. longis; antheris dolabriformis caeruleis.—PERU: open shrub in hillside thickets, Pampayacu, Dept. of Huanuco, July 19-25, 1923, Macbride 5058 (TYPE, Field Museum).

This species appears to be most nearly related to *B. caudata* Triana, Trans. Linn. Soc. 28: 148. 1871, from which it notably differs, especially in its acutish leaves, longer petioles, shorter pedicels and regularly lobed calyx. Its fleshy white flowers with contrasting blue anthers were very attractive. Its name commemorates fittingly the hospitality and aid in collecting extended by Mr. Masaho Sawada of Huanuco, at the hacienda at Pampayacu.

Blakea chanchamayensis, spec. nov., fruticosa-liana; ramis teretibus junioribus dense rubiginoso-furfuraceis demum glabris; foliis 5-nerviis oblongo ellipticis basi apiceque gradatim attenuatis, apice acuminatis plerumque circa 1.5 dm. longis et 5 vel 6 (-7) cm. latis, chartaceo-subcoriaceis, supra glabris, subtus ad nervos paulo furfuraceis vel demum glabris; petiolis mediocriter gracilibus 2-2.5 cm. longis; floribus solitariis vel 2, subsessilibus; pedicellis 2-3 mm. longis; bracteis subaequalibus, exterioribus basi leviter connatis plus

minusve dense furfuraceis fere rotundatis subabrupte acutis circa 1 cm. longis; interioribus fere glabris circa 8 mm. longis; calyce glabro circa 1.5 cm. longo, tubo campanulato, limbo valde 6-lobatis, lobis late ovatis subacutis; floribus signotis.—PERU: Hacienda Schunke, La Merced, Dept. of Junin, Aug. 27-Sept. 1, 1923, Macbride 5676 (TYPE, Field Museum); Chanchamayo Valley, Dept. of Junin, Dec. 1924-1927, Carlos Schunke 299; also Oct., 438.

This plant may be either a *Topoea* or a *Blakea*, so far as can be determined from the fruiting material available. It seems unlikely, however, that it is referable to the former genus since it most nearly approaches in appearance two species of the latter, namely *Blakea caudata* Triana and *B. Holtonii* Hochr. It differs from the former in the narrower gradually acuminate leaves and the subsessile flowers and from the latter in the 5-nerved leaves and subsessile flowers.

Blakea incerta, spec. nov., *P. Spruceana* peraffinis; ramis glabris vel paullo furfuraceis et setulosis ad nodos; foliis inconspicue 7-nerviis; nervis mediano multo crassiore, 2 exterioribus submarginatis vix distinctis; petiolis 1.2-2.5 cm. longis; pedicellis axillaris binis gracilibus 1.2-1.8 mm. longis; bracteis subrotundatis haud acutis demum glabris 1.2-1.5 mm. longis; calycis lobis late ovatis 4-5 mm. longis; petalis roseis vix 1.5 cm. longis.—PERU: forest shrub or tree 5-7 m. high, Cushi, Dept. of Huanuco, June 19-23, 1923, Macbride 4850 (TYPE, Field Museum).

Except for the fact that the flowers are borne in twos this specimen matches well the plate of *B. Spruceana* Cogn. Fl. Bras. 14: 560. tab. 121. f.I. 1888. However, besides the disagreement in the number of flowers, *B. incerta* departs from the description of *B. Spruceana* in a number of ways: the leaves, although indistinctly are actually 7-nerved, the petioles average longer, the pedicels are shorter, the bracts are not at all acute and the calyx-lobes are longer. It approaches *B. latifolia* (R. & P.) D. Don in some respects but is at once distinct by its terete calyx-tube.

Miconia Wagneri, spec. nov., arbuscula foliosa 1.5-2.5 m. alta vel interdum arbor; ramulis petiolis pedunculisque pilis longiusculis adpressis inferne simplicibus apice stellato-multifidis submolliter denseque fulvo-pubescentibus; foliis membranaceis integerrimis vel remote calloso-repando-denticulatis, late ovato-ellipticis, basi apice-que sub- vel rotundatis vel apice acutis, 1.5-2.5 dm. longis, 8-12 cm. latis, nervulo obscurō marginali praetermissō valde 5-nerviis, supra glabris paulo nitidulis, nervis mediocriter prominulis, subtus ad nervos dense, caeteris parce, stellatis, nervis cum nervulis transversalibus prominentibus, venis conspicue ramuloso-reticulatis; petiolis 1.5-2 cm. longis; pedunculis mediocribus plerumque 1 dm.

longis; floribus sessilibus ad apices ramulorum plus minusve glomerulatis vel interdum solitariis vel axillaribus, 4-meris; calycis tubo primum minute stellato demum glabro circa 1.5 mm. longo, limbo chartaceo in prima juventute clauso, in anthesi irregulariter lacero; petalis viridibus fere 2 mm. longis, oblongo-ovatibus; antheris, sublinearibus superne paullo attenuatis, apice minute 1-porosis, basi postice brevissime calcarato, solum 1.5 mm. longis; stylo 5 mm. Dept. of Junin, Aug. 27-Sept. 1, 1923, Macbride 5718 (TYPE, Field Museum); Chanchamayo Valley, Dept. of Junin, Dec., 1924-1927, Carlos Schunke 355.

Only one other species of the section *Laceraria* has 5-nerved leaves, namely *M. Duckei* Cogn. and it has 5-merous flowers and a densely hirtellous calyx. In other respects *M. Duckei* seems, from description, to resemble *M. Wagneri*.

This interesting species is named for Mr. William Wagner of Lima whose hospitality enabled me to make extensive collections in the vicinity of his delightful hot springs resort at Viso, Peru.

Miconia Adreni, spec. nov., arbuscula usque 2 m. alta, fere glaberrima; ramulis flexuosis, plus minusve sulcatis, subacute tetragonis, superne (etiam petiolis paniculisque) praecipue ad nodos minutissime parceque squamuoso-furfurascensibus; foliis subchartaceis utrinque glabris ellipticis vel oblongo-ellipticis, ut videtur apice attenuatis et acutis, basi satis angustatis, in petiolum brevem decurrentibus, 14-18 cm. longis, 5.5-7.5 cm. latis, definite 3-plinerviis; nervis supra mediocriter conspicuis, subtus cum nervulis transversalibus prominentibus, 3 interioribus circa 1 cm. supra basin folii abeuntibus, 2 lateralibus exterioribus a basi; petiolis 1-2.5 cm. longis; paniculis plus minusve foliosis fere 1.5 dm. longis, ramulis acute tetragonis; floribus subsessilibus, 5-meris; calyce 4 mm. longo acute lobato; petalis albis, circa 4 mm. longis; antheris 1-porosis, vix 3 mm. longis, paullo attenuatis, anteriore minute bituberculatis; stylo circa 5 mm. longo, superne leviter incrassato; stigmate capitellato.—PERU: clump shrub at sunny edge of hillside thicket, Pampayacu, Dept. of Huanuco, July 19-25, 1923, Macbride 5077 (TYPE, Field Museum).

This showy-flowered member of the section *Eumiconia* belongs to the group of species typified by *M. prasina* (Sw.) DC. and appears to resemble most *M. juruensis* Pilger. The latter, however, is a tree 15 m. high with much smaller leaves that are very shortly 3-plinerved, and with longer anthers and style.

M. Adreni is named for M. Paul Adrien of the Huaron Mining Company of Shelby, Peru whose friendly aid in my collecting work, together with that of his associates, M. Marcel Tuillier and Mons. André Porret and Auguste Berrier so abundantly merits this mention and recognition.

MICONIA NERVOSA (Sm.) Triana, var. *mediana*, var. nov., foliis longe petiolatis, inferne longe attenuatis; petiolis 2-4 cm. longis; petalis albis.—PERU: open 2 m. bush of montaña, Hacienda Schunke, La Merced, Dept. of Junin, Aug. 27-Sept. 1, 1923, Macbride 5811 (TYPE, Field Museum); 3 m. shrub, La Merced, Aug. 10-24, 1923, Macbride 5507.

The widely distributed typical form of this well-marked species has subsessile leaves with the petioles often only 0.5 cm. long, and red flowers. The specimens cited are intermediate in leaf-character between *M. nervosa* (Sm.) Triana and *M. pseudo-nervosa* Cogn. and suggest that the latter also should be treated as a variety of the former. *M. pseudo-nervosa* differs from *M. nervosa* chiefly in its long-petioled leaves that are obtusish at base. Its flowers are white.

***Miconia Malatestae*, spec. nov.**, robusta, parce ramosa, 3 m. alta, fere glaberrima; ramis obtuse tetragonis, superne sulcatis glabris vel minutissime furfuraceis, ad nodos firme annulatis; foliis glabris, carneo-coreaceis intense viridibus supra subnitidulis, in sicco flavescensibus, integerrimis vel obscure et remote ciliato-denticulatis, oblongo- vel ovato-ellipticis, obtusis vel breviter acutis, basi satis attenuatis et in petiolum brevem crassum decurrentibus, interdum valde disparis, plerumque circa 2 dm. longis et 1 dm. latis, nervulo marginali praetermissis 3-nerviis; nervis supra vix notatis subtus valde conspicuis sed nervulis transversalibus non prominulis; petiolis crassis, 1.5-2 cm. longis; paniculis late pyramidatis 1-2 dm. longis; floribus brevissime pedicellatis, 5-meris; calyce glabro breviter acute lobato circa 4 mm. longo; petalis albis late obovatis 3 mm. longis; staminibus 4.5 mm. longis; antheris linearibus ut videtur 1-porosis, basi breviter bituberculatis fere 3 mm. longis; connectivo infra antheram circa 1 mm. producto; stylo circa 5 mm. longo; stigmate peltato; ovario apice inappendiculata; fructu 6 mm. crasso, purpureo.—PERU: coarse-stalked shrub of montaña, Hacienda Villcabamba on Rio Chinchao, Dept. of Huanuco, July 17-26, 1923, Macbride 5176 (TYPE, Field Museum).

It is unusual for a species of *Miconia* to have the anther-connective greatly prolonged but there is no doubt that such is the case here: the filament itself is linear, not tapering, and shorter than the connective. The relationship of *M. Malatestae* may be with *M. stipularis* Naud. or *M. scutata* Gleason (of the section *Amblyarrhena*) which it resembles vegetatively but its anthers are more nearly characteristic of the section *Eumiconia*. The leaves, or the stamens and ovary of the species mentioned are entirely different from those of our plant.

M. Malatestae is named for Sr. Enrique Malatesta of Huanuco in grateful recognition of the courtesies extended by him to the

members of the Captain Marshall Field Botanical Expeditions to Peru in 1922 and in 1923 particularly when enjoying the hospitality of his Hacienda Villcabamba where this interesting and handsome-foliaged plant was collected.

Miconia modica, spec. nov., arbuscula circa 8 m. alta; rainulis obtuse tetragonis sulcatis, petiolis paniculis calycibusque pilis furfuraceo-stellatis fulvescentibus breviter denseque obtectis; foliis breviter 5-6-plinerviis submembranaceis integerrimis vel obscure remoteque calloso-repando-denticulatis, ovato-ellipticis, basi obtusis vel subrotundatis apice sensim breviter obtuseque acuminatis, plerumque circa 2 dm. longis et 1 dm. latis, supra glabris, nervis non prominentibus, subtus plus minusve fulvo-stellato-furfuraceis praecipue ad nervos nervulosque, nervis cum nervulis transversalibus prominentibus, mediano multo crassiore, 3 interioribus saepius 4-8 mm. supra basin folii abeuntibus, 2-4 lateralibus exterioribus plus minusve distinete a basi; petiolis 4-7 cm. longis; paniculis multifloris; pedicellis 1-2 mm. longis; floribus 5-meris; calyce circa 3 mm. longo; petalis albis, 4 mm. longis, puberulis; filamentis stylo-que glanduloso; antheris oblongo, haud ventricosis, vix 2 mm. longis; stylo 4-5 mm. longo; stigmate capitellato, 1 mm. lato.—PERU: evergreen forest, Choimacota Valley, Prov. of Huanta, Dept. of Ayacucho, Feb. 28-March 10, 1926, Weberbauer 7552 (TYPE, Field Museum).

M. floribunda (Bonpl.) DC., to which this species is closely related, has more densely pubescent leaves borne on petioles 2-4 cm. long, longer anthers bulged at the base and a broadly peltate stigma.

Miconia Pulgari, spec. nov., arbuscula, fere glaberrima; ramis glabris, gracilibus, teretibus; ramulis petiolis pedunculisque glabris vel interdum sparse cum pilis crispulis paullo pubescentibus; foliis membranaceis integerrimis vel minutissime adpresso ciliatis, oblongo-lanceolatis, subabrupte obtuse acuminatis, basi acutis, supra glabris, subtus ad nervos nervulosque parce piloso-hirtellis caeteris glabris, plerumque circa 1 dm. longis et circa 3 cm. latis, 3-plinerviis (nervulo marginali praetermissis); nervis lateralibus exterioribus a basi, interioribus circa 5 mm. supra basin folii abeuntibus, nervis supra vix notatis, subtus cum nervulis transversalibus et venulis bene prominentibus; petiolis 8-10 mm. longis; paniculis densifloris 4-6 cm. longis; floribus 5-meris; pedicellis circa 1 mm. longis; calyce glabro vel minute parceque granuloso-stellato, denticulato, fere 4 mm. longo; petalis late obovatis, circa 2.5 mm. longis; antheris anguste obovoideis, apice paullo arcuatis, minute 1-porosis, circa 1.5 cm. longis; stylo paullo exerto, circa 5 mm. longo, apice subcapitallato.—PERU: Huacachi, near Muña, Dept. of Huanuco, May 20-June 1, 1923, Macbride 4145 (TYPE, Field Museum).

This straggling shrub with pinkish-white flowers belongs in the section *Amblyarrhena* and somewhat resembles several species but

is entirely distinct by virtue of its triplinerved leaves the few other species having this character being altogether different in other respects. Sr. Francisco Pulgar of Panao, by his friendly interest and influence assisted materially in the successful culmination of the difficult trip to Muña and Pozuzo on which journey this fine bush was collected.

Miconia sphagnophila, spec. nov., arbuscula parce ramosa circa 1 m. alta; ramis ramulis petiolis paniculis foliisque subtus setis longiusculis patulis plerumque basi valde incrassatis dense rufo-pubescentibus; foliis breviter 5-7-plinerviis, rigidis, supra bullis conicis longe setuliferis dense obtectis, ovato-ellipticis, basi rotundatis, apice obtusis vel paullo acutis, plerumque 6 cm. longis et 3.5-4 cm. latis; petiolis 8-10 mm. longis; paniculis confertifloris; floribus subsessilibus, 5-meris; calyce 4 mm. longo; petalis albis circa 2.5 mm. longis; filamentis glanduloso-pilosis; antheris fere 2 mm. longis, minute 1-porosis; stylo peltato.—PERU: sphagnum-montaña, Play-apampa, Dept. of Huanuco, June 16-24, 1923, Macbride 4503 (TYPE, Field Museum).

This species is related to *M. hamata* Cogn., *M. hirta* Cogn. and other allies of *M. capitellata* Cogn. of the section *Amblyarrhena*, from all of which it at least differs in the much longer calyx and smaller leaves. Its pubescence seems to resemble that of *M. radula* Cogn. rather closely but that species has 5-nerved leaves.

Miconia trichrona, spec. nov., ut videtur arbuscula; ramis ramulis petiolisque pilis crispis firmiusculis patulis plus minusve dense obtectis; foliis rigidis tenuissime crenulatis, ovatis vel elliptico-ovatis, basi rotundatis, apice aliquid angustatis subrotundatis vel late obtusis, haud acutis, plerumque 8 cm. longis et 4-5 cm. latis, supra bullis crispulis setuliferis, subtus brevissime denseque crispe villoso-hirtellis, 5-7-nerviis; nervis utrinque mediocriter prominenteribus; petiolis 1.5-2 cm. longis; paniculis congestifloris circa 7 cm. longis; floribus sessilibus, ad apices ramulorum glomerulatis; calyce breviter denseque setuloso, circa 2 mm. longo, minute denticulato; petalis fere 2 mm. longis; filamentis glabris; stylo 4 mm. longo, parce piloso; stigmate capitellato.—PERU: above Tabaconas, Prov. of Taen, Dept. of Cajamarca, May, 1912, Weberbauer 6309 (TYPE, Field Museum).

Three members of the section *Amblyarrhena* seem to be about equally related to this species, namely *M. scabra* Cogn., *M. asperrima* Triana, and *M. Ruizii* Naud. *M. trichrona* differs from the first and second in the quality of the pubescence, from the second and third in the obtuse leaves and also from the third in the obscurely lobed calyx.

MICONIA GLABERRIMA (Schlecht.) Naud., var. *australis*, var. nov., foliis basi abrupte obtusis vel submarginatis; paniculis 3-4 cm. longis, minutissime parceque furfuraceo-puberulis.—PERU: open, 1-2 m. shrub, Hacienda Schunke, La Merced, Dept. of Junin, Aug. 27-Sept. 1, 1923, Macbride 5769 (TYPE, Field Museum); also 5771.

Typical *M. glaberrima* (Schlecht.) Naud. of Mexico and Central America has leaves that are acutish or at least somewhat narrowed at base and often a rather large and glabrous panicle. The variety *australis* is not well-marked but in view of its geographic separation its apparent differences seem worth recording.

Miconia Miles-Morgani, spec. nov., arbuscula, 0.5-1 m. alta; ramis gracilibus fere teretibus plus minusve furfuraceo-stellatis demum glabris; ramulis petiolis pedunculisque breviter denseque furfuraceo-stellatis; foliis membranaceis obscure undulato-crenulatis late ovatis vix vel haud acutis, basi rotundatis vel leviter cordatis supra minutissime parceque stellatis vel vetustioribus glabris et plus minusve reticulato-bullatis, subitus subsparse stellatis ad ne vos nervulosque ctiam conspicue reticulatis, 5-nerviis, plerumque circa 5 cm. longis et 3 cm. latis; nervis paulo prominentibus praecipue 2 marginalibus; petiolis gracilibus 1-1.5 cm. longis; paniculis anguste pyramidatis circa 8 cm. longis; pedicellis 1 mm. longis; floribus interdum cernuis, 5-meris; calyce fere glabro, obscure denticulato circa 2 mm. longo; petalis albis circa 2 mm. longis; antheris subcuneiformis, late 2-porosis 1.5 mm. longis; stylo 2 mm. longo, stigmate peltato.—PERU: on trail to Tambo de Vaca from Muña, Dept. of Huanuco, June 5-7, 1923, Macbride 4318 (TYPE, Field Museum).

This attractive bush with fragrant white flowers is closely related to *M. peruviana* Cogn. (Sect. *Cramanium*) but the latter has narrower acute leaves and hirtellous rather than stellate pubescence.

Mr. Miles Morgan of the Cerro de Pasco Copper Corporation and other officials repeatedly aided in the work of the members of the Captain Marshall Field Botanical Expeditions to Peru in 1922 and 1923, and appreciation of their help is recorded gratefully. Mr. Morgan in particular gave generously of his personal time and his interest may be commemorated fittingly in the name of this new species.

Miconia opacifolia, spec. nov., arbuscula circa 3 m. alta, laminis foliorum supra scabris exceptis glaberrima; ramis obtuse tetragonis superne plus minusve sulcatis, subgracilibus; foliis sessilibus membranaceis in sicco supra flavescentibus, subitus aliquanto purpur-ascentibus, obscure et remote undulato-denticulatis, ovato-oblongis vel -lanceolatis, basi cordatis, apice sensim acuminatis, 1.5-2 dm. longis, plerumque 7 vel 8 cm. latis, 5-7-nerviis; nervis supra leviter

impressis, subtus mediano valde prominentibus, exterioribus caeteris multo gracilioribus; paniculis pyramidatis, circa 1 dm. longis; floribus 5-meris, minutis, brevissime pedicellatis; calyce breviter lobato vix 1 mm. longo; petalis ut videtur albis; antheris obovoideis, 2-porosis, truncatis; stylo incluso.—PERU: Hacienda Villcabamba on Rio Chinchao, Dept. of Huanuco, July 17-26, 1923, Macbride 5197 (TYPE, Field Museum).

This species belongs to the section *Cremanium* and most resembles *M. lilacina* Triana which has smaller glabrous entire leaves and larger flowers. The leaves of *M. opacifolia*, notwithstanding the minute scabrosity on the upper surface, were velvety in appearance before drying.

Miconia Ottikeri, spec. nov., arbuscula circa 1 m. alta; ramis ramulisque glabris acute tetragonis subquadriangularis; foliis coraceis minute calloso-ciliato-denticulatis, ovatis, acuminatis, basi subrotundatis, supra glabris, subtus flavescentibus ad nervos (imprimis mediano) nigro-pilosis caeteris glabris, plerumque circa 7 cm. longis et 3-3.5 cm. latis, definite 3-nerviis, nervulo marginali fere obsoleto praetermissio; nervis supra leviter impressis, subtus prominentibus, mediano multo crassiore, venis ramuloso-reticulatis in foliis junioribus conspicuis sed demum obsoletis; petiolis 1.5-2 cm. longis, supra cum pilis nigris longiusculis firmis pubescentibus; paniculis anguste laxis circa 1 dm. longis; pedicellis circa 2 mm. longis; calyce glabro, subhemisphaericō, breviter 5-lobato, 3-4 mm. longo; floribus ignotis; bacca rubra, 5-6 mm. crassa.—PERU: Tambo de Vaca, Dept. of Huanuco, June 10-24, 1923, Macbride 4430 (TYPE, Field Museum).

In spite of the lack of flowers I have little hesitancy in proposing this shrub as a new species because its general characteristics so obviously ally it to *M. flavesens* Cogn. and other members of the section *Chaenopleura*, to none of which, it can be referred. Its sharply angled branches and the curious restriction of the pubescence to the leaf-veins and the petioles are unusual characters for the group.

In naming this neat shrub for Mr. Ottiker, an official of the Ferrocarril Central del Perú, I am recording with pleasure his very welcome aid in the matter of transport from Lima to La Oroya.

Miconia ramosipila, spec. nov., arbuscula vel interdum arbor; ramis superne obtuse tetragonis, sulcatis, plus minusve cum pilis plumosis breviter pubescentibus; petiolis pedunculis ramulisque inflorescentiarum pilis plumoso-penicillatisstellulatisque fulvescentibus intermixtis dense obtectis; foliis integerrimis vel parce adpresso-que breviter ciliatis, submembranaceis, supra glabris, nitidulis et obscure bullatis, subtus ad nervos cum pilis fulvo-plumoso-penicillatis dense pubescentibus, ad nervulos transversalibus et etiam caeteris mediocriter fulvo-stellatis, elliptico-ovatis, subabrupte acutis,

basi subrotundatis vel emarginatis, 1.5-2 dm. longis, 8-10 cm. latis, 7-nerviis; nervis supra vix notatis, subtus 5 valde prominentibus, reliquis 2 marginalibus cum transversalibus parum prominulis; petiolis usque 3-7 cm. longis; paniculis anguste pyramidatis, parce ramosis, ramulis spicatis; floribus glomerulatis, 5-meris; calyce glabratō, 5-lobato, vix 1.5 mm. longo; petalis vix 1 mm. longis; antheris minutissime porosis, sublinearibus vix 0.5 mm. longis, connective distincte breviterque producto; stylo 1 mm. longo; stigmate peltato.—PERU: in montaña, trail from Muña to Tambo de Vaca, Dept. of Huanuco, June 5-7, 1923, Macbride 4321 (TYPE, Field Museum).

Apparently this is a species of the section *Cremanium* and is related in a general way to *M. valida* Cogn. and allies, in spite of the rather narrow anthers. No species of *Eumiconia* seems, from description, to resemble *M. ramosipila* at all closely.

Miconia saxatilis, spec. nov., arbuscula circa 3 m. alta; ramis obtuse, ramulis acute tetragonis, ad nodos incrassatis; ramis ramulis petiolis pedunculis ramulisque inflorescentiarum sordide denseque stellatis; foliis integerrimis vel superne undulato-subdenticulatis late ovato-ellipticis basi et apice subabrupte angustatis, apice etiam breviter acuminatis plerumque 15-18 cm. longis et 7.5-9 cm. latis, membranaceis, supra primum glabris viridibusque, subtus pallide viridibus et etiam tenuiter ad nervos venasque satis stellatis, breviter subtriplinerviis (nervulo marginale praetermissis); nervis lateralibus exterioribus a basi, interioribus 4-8 mm. supra basin folii abeuntibus, nervis interioribus praecipue subtus cum nervulis transversalibus mediocriter prominentibus; petiolis 2-4.5 cm. longis; paniculis densifloris circa 8 cm. longis; floribus minutissimis 5-meris, brevisime pedicellatis; calyce glabratō, obtuse denticulato vix 1 mm. longo; petalis vix 0.5 mm. longis; antheris subcuneiformiis fere 0.5 mm. longis, 2-porosis; stylo circa 1 mm. longo; stigmate peltato.—PERU: wet rocky upland, Playapampa, Dept. of Huanuco, June 16-24, 1923, Macbride 4881 (TYPE, Field Museum).

This slender shrub with tiny flowers perhaps is most nearly related to *M. micrantha* Cogn. of the section *Cremanium* which, however, has glabrous leaves.

Miconia sulcata, spec. nov., arbor parva tota glaberrima; ramis junioribus acute tetragonis et valde quadrisulcatis, robustis; foliis membranaceis integerrimis vel obscure remoteque repando-denticulatis, ovato-ellipticis, apice subrotundatis obtusis, basi plus minusve sensim attenuatis, ut videtur plus minusve disparis, majoribus 3 dm. longis et fere 1.5 dm. latis, supra viridibus, subtus aliquid purpurascensibus, 5-nerviis; nervis supra haud prominentibus, subtus 3 interioribus valde prominentibus, reliquis 2 marginalibus parum prominulis, nervulis transversalibus gracilibus, ramuloso-reticulatis;

petiolis 5-8 cm. longis; paniculis late pyramidatis, multifloris; floribus minutis, subsessilibus, immaturis ut videtur 5-meris; calyce minute denticulato, circa 1 mm. longo; antheris evidente obovoideis; stylo ut videtur punctiformis.—PERU: Chanchamayo Valley, Dept. of Junin, Jan., 1924-1927, *Carlos Schunke* 423 (TYPE, Field Museum).

It may seem unwise to describe as new a *Miconia* that is only in bud so that the floral characters are not entirely discernible but the anthers are sufficiently developed to enable one to place it in either the section *Cremanium* or *Chaenopleura*. No described species of either section, apparently, has such remarkably sulcate branches, large glabrous leaves and extremely small flowers.

MICONIA THEAEZANS (Bonpl.) Cogn., var. *longifolia* (Cogn.), comb. nov. *M. theaezans* (Bonpl.) Cogn., subsp. *viridis* Cogn., var. *longifolia* Cogn. Fl. Bras. 14: 421. 1888.

MICONIA THEAEZANS (Bonpl.) Cogn., var. *tetragona* (Cogn.), comb. nov. *M. theaezans* (Bonpl.) Cogn., subsp. *flavescens* Cogn., var. *tetragona* Cogn. l. c. 421.

The above variants of this variable species of *Miconia* are better treated, it seems to me, as varieties of the species rather than as varieties of two subspecies. This simpler classification is certainly more practical in ordinary usage whatever its disadvantages, if any, in monographic work.

Miconia trichogona, spec. nov., ramis ramulisque teretibus plus minusve flexuosis ad nodos conspicue setosis caeteris glabris; foliis ovatis obscure denticulatis et subadpresso ciliatis, breviter acuminate, basi subcordatis, 9-13 cm. longis, 4-5 cm. latis, supra minute parceque scabris et ad nervos plus minusve pilosis, luteo-viridibus, subtus glabris saepius rufescensibus, 5-7-nerviis; petiolis supra sulcatis et dense setoso-pilosus, 1.5-2 cm. longis; paniculis pyramidatis satis multifloris circa 1 dm. longis; pedicellis circa 1 mm. longis; bracteis subscariosis ad apicem ciliatis circa 5 mm. longis; floribus ignotis; calyce distincte 5-lobato; bacca circa 5 mm. crassa.—PERU: in montaña, Hacienda Villcabamba, Rio Chinchao, Dept. of Huanuco, July 17-26, 1923, *Macbride* 5178 (TYPE, Field Museum).

There are only a few species of *Miconia* with glabrous branches setose only at the nodes and none of them apparently except *M. setinodis* (Bonpl.) Naud. of the section *Cremanium* approaches our Peruvian species closely and it has 6-8-merous flowers and smaller 3-5-nerved leaves.

Miconia vitiflora, spec. nov., arbuscula, circa 2 m. alta; ramis ramulisque inflorescentiarum obtuse tetragonis vel subteretibus, primum praecipue ad nodos longe plumoso-pubescentibus demum glabris; petiolis plerumque 6-11 cm. longis cum pilis crispulis plumosis

pallide fulvescentibus plerumque 3-5 mm. longis dense pubescentibus; foliis submembranaceis supra intense viridibus, glabris, subtus plus minusve purpurascensibus, ad nervos nervulosque breviter stellato-plumoso-pubescentibus, subrotundatis vel subcordatis, apice abrupte breviter obtuseque acuminatis, plerumque 1.5-2 dm. longis et 1-1.5 dm. latis, 7-nerviis; nervis supra leviter impressis, subtus cum nervulis transversalibus ramuloso-reticulatis prominentibus, mediano multo crassiore; paniculis multifloris, late pyramidatis, circa 1.5 dm. longis; floribus 5-meris, ut videtur subdioicis; pedicellis vix 1 mm. longis; calyce glabro, acute denticulato; petalis vix 1 mm. longis; antheris obovoideis, late biporosis, connectivo breviter producto, antice minute tuberculato; stylo 1 mm. longo; stigmate peltato; bacca fere 4 mm. crassa.—PERU: montaña slope at Hacienda Villcabamba, Dept. of Huanuco, July 17-26, 1923, Macbride 5165 (TYPE, Field Museum).

Apparently the only species of the section *Cremanium* related to *M. vitiflora* is *M. polygama* Cogn. and it has smaller leaves that are hirsute on both sides.

Miconia brevis, spec. nov., arbuscula tota glaberrima; ramis teretibus vel junioribus obscure tetragonis; foliis subcoraceis obscure crenulato-denticulatis ovato-ellipticis, basi acutiusculis vel obtusis, apice obtusis interdum ad apicem breviter abrupteque angustatus sed haud acutis, plerumque circa 4 cm. longis et 2 cm. latis, 5-nerviis vel subtriplinerviis, nervulo marginali praetermissis; nervis gracilibus supra 3 interioribus satis impressis, 2 exterioribus vix notatis, subtus 3 prominentibus reliquis 2 marginalibus parum prominulis, venis anguste reticulatis; petiolis gracilibus, 1-2 cm. longis; paniculis plus minusve cernuis, 4-5 cm. longis; pedicellis vix 1 mm. longis; calyce obscure 5-denticulato, 2 mm. longo; petalis 5, ut videtur albis irregulariter suborbicularis, vix 2 mm. longis; staminibus 10; filamentis triangularibus, 1.5 mm. longis; antheris late obovoideis, vix 1 mm. longis; stylo glabro, fere 5 mm. longo; stigmate capitellato.—PERU: between Huancabamba and Ayavaca, Dept. of Piura, May, 1912, Weberbauer 6334 (TYPE, Field Museum).

Other species of the section *Chaenopleura* which most resemble this shrub vegetatively, notably *M. alpina* Cogn. and *M. fruticulosa* Cogn., have 4-merous flowers. *M. brevis* seems to be well-marked, apart from its 5-merous flowers, by its short 5-nerved leaves, short pedicels, calyx, petals and stamens.

Miconia Griffisii, spec. nov., arbuscula satis ramosa et foliosa, 1-1.5 m. alta; ramis teretibus vel superne subtetragonis petiolisque breviter dense setuloso-hirtellis haud furfuraceis vel stellatis; foliis mediocriter coriaceis integerrimis vel obscure et remote callosociliatis oblongo- vel ovato-ellipticis breviter obtuseque acuminatis vel acutis, basi obtusis vel vix acutis, supra glabris, subtus ad nervos nervulosque parce hirtellis caeteris glabris, plerumque circa 8 cm.

longis et 3-3.5 cm. latis, nervulo marginali praetermissis 3-nerviis; nervis nervulisque supra satis impressis, subtus 3 valde prominentibus, 2 marginalibus vix notatis, nervulis conspicue ramuloso-reticulatis; petiolis 7-12 mm. longis; paniculis densifloris circa 1 dm. longis; floribus 4-meris; pedicellis circa 5 mm. longis; calyce turbinato-campanulato, glabratu, 4 mm. longo, distincte lobato; lobis subrotundatis, extus tuberculatis; petalis albis, suborbicularis, circa 3 mm. longis; antheris obovoideis, circa 1.5 mm. longis; stylo 5-6 mm. longo; stigmate peltato.—PERU: Tambo de Vaca, Dept. of Huanuco, June 10-24, 1923, Macbride 4382 (TYPE, Field Museum).

The anthers of this species are entirely characteristic of the section *Chaenopleura* no member of which resembles *M. Griffisii* closely unless possibly the poorly described *M. thyrsoides* (D. Don) Naud. which, however, is said to have tomentose branches, leaves pilose beneath on the nerves and smaller flowers.

This handsome shrub with showy white flowers is named for Mr. C. N. Griffis of Lima the well-known editor and English Secretary to the President. He extended most helpfully the courtesies of the government to the Captain Marshall Field Botanical Expeditions to Peru in 1922 and 1923.

***Miconia trichocaula*, spec. nov.,** arbuscula valde ramosa; ramis ramiculis petiolisque dense rufo-pubescentibus cum pilis patentibus firmiusculisque 2-3 mm. longis et pilis brevisque furfuraceo-plumosis intermixtis; foliis numerosissimis obscure repando-denticulatis submembranaceis subrotundato-ellipticis haud acutis, supra glabris laevibusque, subtus solum ad nervos paullo furfuraceis, plerumque circa 2 cm. longis et 1.5 cm. latis, 3-nerviis; petiolis 5-8 mm. longis; racemis 1-2 cm. longis, pseudoaxillaribus, paucifloris; pedicellis 2-3 mm. longis; floribus 4-meris, plus minusve cernuis; calyce glabro 4-denticulato, fere 2 mm. longo; petalis suborbicularis vix 1.5 mm. longis; antheris obovoideis; stylo inclusu vix 1.5 mm. longo; stigma peltato.—PERU: above Huancabamba, Dept. of Piura, April, 1912, Weberbauer 6094 (TYPE, Field Museum).

This is an addition to the section *Chaenopleura* and from description is related to *M. bullata* (Turcz.) Triana. The leaves of the latter, however, are characterized as bullate-tuberculate above and pilose on the veins beneath.

***Miconia dichrophylla*, spec. nov.,** arbor 5 m. alta; ramulis acute tetragonis, superne valde compressis, junioribus petiolis pedunculis paniculisque dense squamuoso-pubescentibus; foliis submembranaceis obscure undulatis vel inferne integerrimis, oblongo-ovatis vel -lanceolatis plerumque circa 1.5 dm. longis et 5 cm. latis, basi acutis, apice in caudiculam (acumine 1-2 cm. longo) subabrupte contracto, supra viridibus laevibusque, subtus argenteis pilis lepidotis adpressis

ad medium (praecique ad nervos nervulosque) saepius fulvo-punctatis dense vestitis, 3-plinerviis; petiolis 5-7 mm. longis; paniculis anguste pyramidatis paullo ramosis 0.5-1 dm. longis; paniculae ramis simplicibus vel inferne bi-trifidis 1-2 cm. longis, subsecundifloris; floribus 5-meris sessilibus; calyce campanulato circa 2 mm. longo, leviter 5-costato, minutissime dentato, squamulis fulvis et albidis lepidotis utrinque tecto; petalis suborbicularis circa 1.5 mm. longis, glabris; antheris oblongo-linearibus, apice paullo attenuatis, ut videtur minute uniporosis circa 1 mm. longis, connectivo infra loculos non producto, basi antice obscure bigibboso, postice breviter calcarato; stylo vix clavato, truncato, vix 1.5 mm. longo.—PERU: slender tree of montaña, La Merced, Dept. of Junin, Aug. 10-24, 1923, Macbride 5495 (TYPE, Field Museum).

The flowers of this species are not fully developed and consequently I am not positive as to their characters: certainly, however, the anthers are spurred posteriorly and this characteristic apparently eliminates the possibility of referring *M. dichrophylla* to either *M. lepidota* DC. or *M. fulva* (Rich.) DC. to both of which it bears at least some superficial resemblance.

***Miconia nectaria*, spec. nov.,** arbor 5-7 m. alta, glaberrima; ramis ramulisque teretibus vel superne plus minusve compressis; foliis subcoriaceis ubique pallide viridibus integerrimis, anguste vel oblongo-ovato-lanceolatis, apice sensim et longe acuminatis, basi acutis vel subobtusis, 1.5-2 dm. longis, 4-6.5 cm. latis, 3-nerviis vel subtriplinerviis; nervis supra leviter impressis, subtus cum nervulis transversalibus satis prominentibus; petiolis 1 vel 2 cm. longis; petiolo etiam lamina basin versus 3-5 nectariis cupiliformis stipitatis instructo; nectariis 2-5 mm. latis; paniculis mediocribus, pyramidatis, 1-1.5 dm. longis; pedicellis circa 2.5 mm. longis; floribus ignotis; calyce 5-lobato; lobis ovatis; bacca subglobosa, 3 mm. crassa; semina pyramidata.—PERU: slender tree of montaña slope, Hacienda Schunke, La Merced, Dept. of Junin, Aug. 27-Sept 1, 1923, Macbride 5738 (TYPE, Field Museum).

This species and the following are exceptionally well-marked by the nectar-like appendages that are borne with uniform regularity on the petioles and leaf-bases.

***Miconia Aspiazui*, spec. nov.,** *M. nectaria* affinis; ramis ramulisque satis compressis; foliis membranaceis integerrimis ellipticis, basi breviter acutis vel attenuatis, apice, subabrupte longo-acuminatis vel fere caudatis 1.5-2 dm. longis, 8-12 cm. latis, 5-nerviis vel sub-5-plinerviis; petiolis circa 3 cm. longis; paniculis 1.5-2 dm. longis, multifloris; ramulis spiciformis; floribus ignotis; calyce ut videtur minute 5-denticulato; bacca subglobosa, circa 5 mm. crassa.—PERU: La Merced, Dept. of Junin, Aug. 10-24, 1923, Macbride 5586 (TYPE, Field Museum).

This species has the same curious appendages on the petioles that are described as occurring on the probably closely related *M. nectaria*. *M. Aspiazui*, however, is clearly distinct by virtue of its very different foliage. It is named for Dr. R. Aspiazu, distinguished physician and surgeon of Lima, and enthusiastic student of the local flora who generously aided the work of the Captain Marshall Field Botanical Expeditions to Peru.

Icaria, gen. nov. Flores 4-meri. Calycis turbanato-campanulatus; limbus dilatatus, lobatus. Stamina aequalia, breviuscula; filamentis late alatis; antherae breves, ut videtur longitudinaliter 1-2-rimosae, connectivo sub loculis nullo vel non elongato, lateraliter in appendicem latam dilatatam emarginatam fere erecto producto. Ovarium liberum. Bacca sicca coriacea.—Frutex glabratu, caule elongato, tortuoso, adscendente, teretiusculo. Folia petiolata, 3-nervia. Flores mediocres, pedicelati in paniculas parvas terminales depositi.—Affinis videtur *Miconiae*.

Icaria fichtilis, spec. nov., fruticosa laxe ramosa; ramis ut videtur suberecto-patentibus flexuosis teretibus glabris, vel junioribus ramulis petiolisque obscure furfuraceis; foliis integerrimis vel minutissime sparseque ciliatis, glabris vel subtus indeincte furfuraceis, late ovato-ellipticis, basi subcordatis, apice vix acutis, plerumque 3-4 cm. longis et 2-2.5 cm. latis, 3-nerviis; nervis subtus paullo prominentibus, nervulis transversalibus haud ramuloso-reticulatis; petiolis gracilibus 1-1.5 cm. longis; paniculis paucifloris racemiformis, 5-7 cm. longis; pedunculis ramulisque inflorescentiarum breviter stellato-furfuraceis; floribus longe pedicellatis; calyce circa 7 mm. longo, subtiliter stellato-furfuraceo, tubo turbinato, limbo dilatato, 4-lobato, extus minutissime tuberculato; lobis late ovatis; petalis circa 5 mm. longis et 6 mm. latis; staminibus fere 6 mm. longis; filamentis 2 mm. latis; antheris obovoideis; appendicibus 1.5 mm. longis, 1 mm. latis, apice irregulariter bidentatis; stylo 4 mm. longo; stigmate peltato; bacca (immatura) 5 mm. crassa, calycis lobis persistentibus coronata.—PERU: in patches on steep shady slope, Tambo de Vaca, Dept. of Huanuco, June 10-24, 1923, Macbride 4431 (TYPE, Field Museum).

The aspect of this shrub is that of several species in the section *Chaenopleura* of *Miconia* but the broadly winged filaments and the curious wing-like erect appendages at either side of the anther at its base are characters that are entirely at variance with the generic character of that genus. The fruit, however, is undoubtedly baccate which places the plant in the tribe *Miconieae* although in this tribe highly specialized stamineal development is most unusual. I am indebted to Dr. Paul C. Standley for suggesting the generic name.

5. VARIANTS OF OSTRYVA AND A TEXAS TEPHROSIA

OSTRYVA VIRGINIANA (Mill.) K. Koch, forma *glandulosa* (Spach), comb. nov. *O. virginica* (Moench.) Willd., var. *glandulosa* Spach, Ann. Sci. Nat. 2 sér. 16: 246. 1841. *O. virginiana* (Mill.) K. Koch, var. *glandulosa* (Spach) Sarg. Bot. Gaz. 62: 216. 1919.

My attention has been called to this form—characterized by the presence, in greater or less abundance, of stiffish glandular trichomes intermixed with the usual substrigose pubescence of the petioles, young branchlets and peduncles—by my own collection, number 7000 from Trout Park, Elgin, Ill., Aug. 30, 1926. Examination of the series of specimens in the Illinois Herbarium of the Field Museum indicates that this variant is not at all uncommon and apparently grows together with the typical eglandular state of the species, as observed for Indiana by Mr. Deam, Trees of Ind., Dept. Conserv. Publ. 13: 80. 1921. As there appear to be no other differences associated with the glandulosity, it seems better to regard it as merely a glandular form. House, N. Y. State Mus. Bull. 254: 267. 1924 lists it for western New York with the remark "is scarcely worthy of varietal rank." It seems to grow with the typical form in general throughout the northern portion of the species' range but the specimens of forma *glandulosa* that I have seen from New England, New York and Pennsylvania are usually less glandular than many, at least, of the collections from farther west.

In this connection I have studied the specimens in the herbarium of the Field Museum from the southern area of the species' range and have reached the conclusion of Winkler, Pflanzenr. 4. 61: 22. 1904, that the Mexican and Central American plants with somewhat more pubescent more nearly oblong more or less doubly serrate leaves are too nearly approached by material from the southern states and accordingly are better regarded as constituting a geographical variety, that even then is often obscurely marked. Standley, Contrib. U. S. Nat. Herb. 23: 169. 1920, considers the Mexican plant, under the name *O. guatemalensis* (Winkl.) Rose, "very closely related to *O. virginiana* but seems fairly distinct." However, he describes the leaves as "ovate" which is indicative of their variability since the term is applicable particularly to the form proposed as *O. mexicana* Rose, very properly referred by Standley to *O. guatemalensis*. If one regards *O. virginiana* as distinct from the Old World *O. italicica* and the Mexican plant as a variety of the former, its name and synonymy are as follows:

Ostrya virginiana (Mill.) Koch, var. *guatemalensis* (Winkl.), comb. nov. *O. italicica* Scop., subsp. *virginiana* (Mill.) Winkl., var. *guatemalensis* Winkl. *Pflanzenr.* 4: 61: 22. 1904. *O. guatemalensis* (Winkl.) Rose, *Contrib. U. S. Nat. Herb.* 8: 292. 1905. *O. mexicana* Rose, l.c.

Tephrosia onobrychoides Nutt. *Journ. Acad. Phil.* 7: 104. 1834; T. & G. *Fl. N. Am.* 1: 292. 1838.—**TEXAS:** Dallas, June, 1877, Reverchon; Fayette Co., 1892, E. W. Crawford 47; Houston, June 17, 1926, G. Eifrig. **INDIAN TERRITORY:** Limestone Gap, July 4, 1877, Geo. D. Butter 115. **LOUISIANA:** Dr. Hale.

Tephrosia onobrychoides Nutt., var. *texana* (Rydb.), comb. nov. *Cracca texana* Rydb. *N. Am. Fl.* 24: 176. 1923.—**TEXAS:** Hemstead, July 1, 1872, E. Hall 119; Hockley, 1890, W. F. Thurrow; Fayette Co., 1891, H. Wurzelow; Houston, July 13, 1926, G. Eifrig. **LOUISIANA:** Alexandria, Hale.

Dr. Rydberg's *Cracca texana*, l.c., is a fairly well marked herbarium species by virtue of the appressed strigose character of its pubescence especially on the calyx and under surfaces of the leaves. The pubescence of typical *T. onobrychoides* is more pilose in quality and mostly spreading. However, there is some intermixture of strigose hairs. Furthermore, as shown by the above citations, collections have been made in the same localities that, except for this somewhat variable difference in the nature of the pubescence, appear to be indistinguishable. Accordingly it seems that the character of *T. onobrychoides* can be most logically defined by including *C. texana* in it as variety.

FIELD MUSEUM OF NATURAL HISTORY

FOUNDED BY MARSHALL FIELD, 1893

PUBLICATION 264

BOTANICAL SERIES

VOL. IV, No. 8

STUDIES OF AMERICAN PLANTS—I

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CHICAGO, U. S. A.

October 24, 1929

PRINTED IN THE UNITED STATES OF AMERICA
BY FIELD MUSEUM PRESS

STUDIES OF AMERICAN PLANTS—I

PAUL C. STANLEY

The following pages are occupied primarily with descriptions of new species of Mexican and Central American plants, recognized in collections received for determination, chiefly from Prof. Samuel J. Record of the School of Forestry, Yale University, and Associate in Wood Technology in Field Museum.

The most important of these collections is one made by Mr. G. Proctor Cooper in the winter of 1927-28 in the general region of Almirante, Panama. Mr. Cooper collected a few numbers, also, about Permé, on the San Blas Coast of Panama. His collection is the most interesting that the writer ever has received for study. It consists chiefly of trees, the plants most difficult to collect, and the ones which receive least attention from most collectors. It is not surprising, therefore, that the Cooper collection should contain so large a number of undescribed species, especially since it comes from localities in which little or no botanical work had been done previously. It contains representatives of one family and of several genera unknown previously from Central America, and of two genera which appear to be undescribed.

This Panama collection emphasizes the remarkable wealth of the Panama flora, and proves that it still needs further exploration. A few of the Cooper collections, although in fairly good condition, still baffle determination, and evidently represent plants of great interest. The value of the collection is enhanced by the fact that wood was obtained from many of the trees. The Panama Expedition was organized by the School of Forestry of Yale University, and also supported by the New York Botanical Garden and Field Museum. A set of the specimens is deposited in each of these institutions, and duplicates have been distributed to other herbaria.

Another important Central American collection received through Professor Record is one consisting of several hundred numbers made on the eastern coast of Nicaragua in the region of Bragman's Bluff by F. C. Englesing. Nicaragua is at present perhaps the least known botanically of the Central American countries, and no collections, at least none of any considerable size, have ever been made near the Atlantic coast, except along the San Juan River.

Mr. Englesing's series is too small to give a comprehensive idea of the flora of the region, but in general it indicates, as would be expected, a flora similar to that of the northern coast of Honduras.

It includes a substantial number of interesting new species, some of which already have been published by the writer in *Tropical Woods*.

The value of Mr. Englesing's specimens is increased by the copious notes which accompany many of them. These include information regarding habitat, vernacular names, associated plants, size, color descriptions, and economic data. If all collectors would supply similar data, botanical knowledge would advance rapidly.

In the United States, especially, too little attention is given to supplying data with botanical specimens. Our herbaria are cluttered with inferior specimens which bear no other data than locality and date of collection. The larger herbaria have such vast quantities of United States material that they are obliged to cull critically new collections and discard specimens of the more common species. I have myself filled many waste baskets with such specimens, which were not useful even for exchange purposes. If these same specimens had been accompanied by full descriptive data, it is almost certain that they would have received a permanent place in the herbarium.

Most collectors of our United States flora seem to believe that the species are so well known that descriptive notes would be superfluous, but this is far from being true. Search in the herbarium for notes regarding the color of flowers of *Geranium maculatum* or any other common plant, and you will be surprised at the lack of informative data.

Certain old-fashioned closet botanists of the writer's acquaintance look upon such notes, particularly those regarding vernacular names and economic data, with mild amusement, as representing a personal fancy of the collector, but there is no question that such data are of far more value and interest to the botanical world in general than the number of stamens in a *Crataegus* flower or millimetric variations in pappus length.

In the present paper there are described numerous new species contained in a large collection of plants made by Mrs. Ynes Mexia in the states of Jalisco and Nayarit, Mexico. This is one of the most important and valuable series obtained in Mexico in recent years. It comes from localities previously unexplored, for Mrs. Mexia did not confine her activities to the usual fields along railway lines. Most of the species based upon her collections are strikingly distinct. Dr. S. F. Blake already has described several new Compositae from the same collection, and Dr. B. L. Robinson has dedicated to Mrs. Mexia a genus of the same family, *Mexianthus*.

Besides the descriptions of new species, there are included here new nomenclatorial combinations which are necessary under the International Rules. Most of these are made for the purpose of bringing the nomenclature of the Trees and Shrubs of Mexico (volume 23 of the Contributions from U. S. National Herbarium) into conformity with those rules.

Unless otherwise indicated, all the specimens listed on the following pages are in the herbarium of Field Museum of Natural History.

CYPERACEAE

Kyllinga nudiceps C. B. Clarke in herb, sp. nov.—Plantae e rhizomatibus brevibus, horizontalibus vel adscendentibus erectae; culmi graciles, erecti, 20-50 cm. longi, vix 1 mm. crassi, glabri; folia omnia ad vaginas reducta, vaginis purpurascensibus, ad 7 cm. longis, ferrugineo-punctulatis, apice obliquis; flores capitati, capite solitario, ebracteato, subgloboso, 5-6 mm. diam.; gluma nucigera navicularis, ovata, acuta, brunneo-punctulata, carina laevi.—Costa Rica: Wafer Bay, Cocos Island, January, 1902, H. Pittier 16272 (U. S. Nat. Herb. No. 472,463, type). Cocos Island, Snodgrass & Heller 944.

The species is well marked by the absence of bracts at the base of the inflorescence.

AMARYLLIDACEAE

Zephyranthes brevipes (Baker) Standl., sp. nov. *Zephyranthes carnata* var. *brevipes* Baker; Donn. Smith, Enum. Pl. Guat. 3: 80. 1893, nomen nudum.

Bulbus c. 2 cm. diam., longicollis; folia scapum aequantia, 1.5-5 mm. lata, glabra; scapus gracilis, 6-25 cm. longus; spathe membranacea, 2 cm. longa, valvis longiattenuatis; ovarii stipes 3-5 mm. longus; perianthium roseum, 7 cm. longum, segmentis oblanceolatis, 1 cm. latis vel angustioribus, obtusis, tubo 2 cm. longo.—Guatemala: Santa Cruz, Dept. Alta Verapaz, alt. 1,380 m., April, 1889, J. D. Smith 1671 (U. S. Nat. Herb. No. 932,985, type).

There are referred here also *J. D. Smith 2793*, *Deam 6253*, and *Tuerckheim 44* and *II. 1417* from Guatemala. The vernacular name is "flor de Mayo." Some of the specimens have been determined as *Z. sessilis* Herb. In *Z. carinata* (Spreng.) Herb., from which this is segregated, the stipe of the ovary is over 1 cm. long.

IRIDACEAE

Nemastylis Lehmannii Standl., sp. nov.—Bulbus parvus, angustus, brunneus; folia basalia 2-3, ad 9 cm. longa, 3 mm. lata, plicata, basi late vaginantia, vaginis brunneo-maculatis; scapus 1-3.5 cm. altus; spathe solitaria, 2-3-flora, c. 3 cm. longa, basi bractea foliacea fulcrata, valvis tenuibus, brunneo-maculatis; perianthium 2 cm. longum, segmentis ovatis; antherae 6-7 mm. longae, plerumque columna staminali breviores.—Guatemala: Between the volcanoes

of Tajumulco and Tajaná, alt. 3,600 m., *F. C. Lehmann* 1556 (U. S. Nat. Herb. No. 933,773, type). Los Encuentros, Dept. Sololá, alt. 2,850 m., *Shannon* 3600.

Nemastylis tenuis (Baker) Benth. & Hook., which also grows in Guatemala, has 1-flowered spathes, and scapes usually more than 10 cm. long.

Eleutherine guatemalensis Standl., sp. nov.—*Bulbus* c. 3.5 cm. *longus*, *brunneus*; *folia basalia* 2-3, *petiolata*, 30-70 cm. *longa*, 1-1.5 cm. *lata*, *glabra*, *longe attenuata*, 3-nervia, *plicata*, *erecta*; *scapi* 40-70 cm. *alti*, *graciles*, *subteretes*, *glabri*, *bractea foliis simili sed angustiore*; *spathae plerumque* 2-3, 4.5-6.5 cm. *longae*, *subaequales*, *multinerviae*, *pedunculis* 8-20 cm. *longis*; *perianthium album*, *post anthesin caeruleo-fulvo*, 3 cm. *latum vel angustius*; *capsulae* 1 cm. *longae vel longiores*.—Guatemala: Cobán, alt. 1,350 m., June, 1907, *H. von Tuerckheim* II. 1885 (U. S. Nat. Herb. No. 933,801, type). Salamá, Cook & Doyle 221. Santa Rosa, von Tuerckheim 1431. Cobán, von Tuerckheim 3775.

The only other Central American species, *E. bulbosa* (Mill.) Urban, has spathes 2 cm. long or shorter.

LACISTEMACEAE

Lacistema pedicellatum Standl. Journ. Washington Acad. Sci. 17: 8. 1927.

An extension of range for this species is furnished by Cooper 568 (Yale No. 12,201), from Flat Rock, region of Almirante, Panama. The specimens were taken from a tree 6 m. high, with a trunk 5 cm. in diameter.

CHLORANTHACEAE

Hedyosmum scaberrimum Standl., sp. nov.—*Arbor dioica*, ramicibus, internodiis 2-7 cm. longis, punctulis pallidis plus minusve asperulis; *vaginae stipulares* 6-12 mm. longae, supra dilatatae, asperulae; *petioli* 4-8 mm. longi, asperuli, remote ciliolati; *limbus lanceolato-oblongus vel oblongo-ob lanceolatus*, 10.5-15.5 cm. longus, 3-4.5 cm. latus, abrupte longiacuminatus, acumine acuto, basi attenuatus, in toto margine serrulatus, chartaceus, subtus pallidior, utrinque punctulis creberrimis albidulis scaberrimus; *cymulae femineae racemoso-paniculatae*, *paniculis terminalibus et lateribus*, 6-7 cm. longis, rhachi glabra, *cymularum pedunculis* 1-2 mm. longis, incrassatis, glabris, *cymulis* 3 mm. latis, bracteis alte connatis, drupas subaequantibus, parte libera late oblonga, apice subtruncata vel late rotundata; *drupae* 3 mm. longae, obtuse

trigonae, glabrae, apice perigonio persistente coronatae.—Panama: Buena Vista Camp on Chiriquí Trail, alt. 375 m., 1928, G. P. Cooper 595; Yale No. 12,228 (Herb. Field Mus. No. 579,611, type).

A tree of 6 m., the trunk 5 cm. in diameter. Flowers white. The pith has a jellylike secretion

Only two other species of *Hedyosmum* have been known from Central America, and they grow usually at much higher elevations than this Panama tree. *H. scaberrimum* is related to *H. callososerratum* Oerst., of the Costa Rican and Nicaraguan mountains, but that has sessile cymules and smooth leaves.

MORACEAE

Perebea glabrata Standl., sp. nov.—Arbor mediocris, ramulis c. 7 mm. crassis, subteretibus, brunneis, minute strigilosis, parce elevato-lenticellatis, internodiis 2-6 cm. longis; stipulae non visae, deciduae; petioli crassi, 9-13 mm. longi, sparse strigilosi; limbus ovali-oblongus, 21-32 cm. longus, 9-12 cm. latus, apice obtusus vel rotundatus et caudato-cuspidatus, acumine e basi deltoidea linearis, 1.5-2 cm. longo, basi late rotundatus vel brevissime cordatus, integer, subcoriaceus, supra obscure viridis, ad nervos non elevatos sparse et minute pilosulus vel glabrus, subtus brunnescens, asperulus, ad nervos minutissime scaberulus, nervis lateralibus prominentibus, utroque latere c. 21, arcuatis, divaricatis, prope marginem laxe anastomosantibus; inflorescentiae femineae axillares, solitariae vel geminatae, brevipedunculatae, 1.2-2 cm. diam., pluriflorae, bracteis dense imbricatis, late ovatis, acutis, adpressis, superne sericeis; perigonium 6 mm. longum, versus basin angustatum, breviter pilosulum, apice abrupte contractum et rotundatum, ore minuto, 4-denticulato, styli ramis brevissimis, exsertis.—Panama: Permé, San Blas Coast, April 3-10, 1928, G. P. Cooper 634; Yale No. 12,267 (Herb. Field Mus. No. 579,239, type).

According to the collector's notes, this is a tree of 9 m., with a trunk diameter of 10 cm., the flowers yellow, the bark with creamy but not very sticky sap.

Two other species of *Perebea* have been described from Central America, both from Panama. The one more nearly related to *P. glabrata* is *P. Markhamiana* (J. Collins) Benth., but in that the leaves are serrate-dentate, and glabrous beneath.

Ficus Proctor-Cooperi Standl., sp. nov.—Arbor alta, ramulis crassis, glabris, dense foliatis; stipulae ovato-oblongae, 15 cm. longae, acuminatae, brunneae, deciduae, extus minute sericeae vel glabratae; limbus elliptico-ovobatus, 17.5-18.5 cm. longus, 9.5-10.5

cm. latus, apice late rotundatus, basi obtusus vel acutus, subcoriaceus, glaber, nervis supra prominulis, subtus prominentibus, lateralibus utroque latere c. 11, angulo lato divergentibus, tenuibus, leviter curvatis, prope marginem laxe anastomosantibus; receptacula subsessilia, pedunculo 3 mm. non superante, globosa, 1.5-2 cm. diam., dense albido-sericea, apice late rotundata, ostiolo parum elevato; involucrum profunde bilobatum, 1.5 cm. longum, lobis ovatis, apice rotundatis, rigidis, obscure brunneis, dense et minutissime puberulis.—Panama: Permé, San Blas Coast, April 3-10, 1928, G. Proctor Cooper 641; Yale No. 12,274 (Herb. Field Mus. No. 579,226, type).

A tree 15-18 m. high, with a trunk diameter of 60 cm., the buttresses high and narrow.

Related to *F. involuta* (Liebm.) Miq., which has relatively narrower leaves, with fewer lateral nerves.

Ficus Lehmannii Standl., sp. nov.—Ramuli validi, 5-6 mm. crassi, glabri, ochracei vel brunnescentes, internodiis brevissimis; stipulae 16 mm. longae, anguste triangulares, longiattenuatae, deciduae, brunneae, crassae, glabrae; petioli 8-14 mm. longi, crassi, supra sulcati, glabri; limbus obovatus vel obovato-oblongus, 5-10 cm. longus, 3-4.5 cm. latus, apice obtusus vel subrotundatus et obtuse breviter protractus vel breviacuminatus, acumine acuto vel obtuso, crasse coriaceus, integer, glaber, concolor, costa et nervis utrinque prominentibus, nervulis arcte reticulatis, costa gracili, nervis lateralibus utroque latere c. 12, angulo lato divergentibus, fere rectis, prope marginem aequaliter conjunctis; receptacula geminata, sesilia, depresso-globosa, 6 mm. lata, apice subtruncata, minutissime puberula, ostiolo paullo depresso; involucrum asymmetricum, breviter bilobatum, 4 mm. longum, glabrum, lobis late rotundatis.—Colombia or Ecuador: Without definite locality, *F. C. Lehmann* 5607 (U. S. Nat. Herb. No. 933,492, type).

A well-marked species, notable for the thick leaves with elevated venation, and for the sessile depressed receptacles with asymmetric involucra.

LORANTHACEAE

Struthanthus costaricensis Standl., sp. nov.—Suffrutex parasiticus, omnino glaber, ramis subteretibus, elongatis, scandentibus vel pendulis; petioli validi, 8-15 mm. longi; limbus ellipticus vel late ellipticus, 5.5-10 cm. longus, 3.5-6.5 cm. latus, acutus vel abrupte acuminatus, rarius obtusus, basi acutus vel abrupte decurrentis, coriaceus, nervis lateralibus utroque latere 5-6, prominulis, tenuissimis; spicae plerumque foliis duplo breviores, floribus et cymis sessilibus; floris staminalis perianthium 3-4 mm. longum; bracteae caducae; stylus rectus.—Costa Rica: Forests of Tuis, alt. 650 m., November, 1897, A. Tonduz 11458 (U. S. Nat. Herb. No. 577,444, type).

In the related *S. polystachyus* (Ruiz & Pav.) Blume, which occurs in Panama, the leaves are lance-oblong, and rounded at base.

POLYGONACEAE

Coccocloba reflexiflora Standl., sp. nov.—Arbor, rammulis crassiusculis, subteretibus, vetustioribus griseis, lenticellatis, rimosis, novellis glaucescentibus, sulcatis, glabris, internodiis 1 2-2 cm. longis; ocreae 4-12 mm. longae, 4-6 mm. latae, subadpressae, limbo deciduo; petioli crassi, 2.5-5 mm. longi, subteretes, glauci, minute puberuli vel glabri; limbus oblongo-obovatus, 5.5-8.5 cm. longus, 2.3-4.8 cm. latus, apice rotundatus, rarius brevissime protractus, basin versus angustatus, basi ipsa obtusa vel anguste rotundata, coriaceus, griseo-viridis, concolor, supra glaber, costa et nervis elevatis, nervulis densissime prominulo-reticulatis, subtus ad costam breviter barbatus, costa gracili, elevata, nervis lateralibus utroque latere 4-5, gracilibus. elevatis, angulo acuto adscendentibus, leviter curvatis, propre marginem conjunctis, nervulis arcte reticulatis; racemi brevitor pedunculati, solitarii, 8-12 cm. longi, laxe multiflori, rhachi minutissime puberula; ocreolae minutae, 0.4 mm. longae; pedicelli 1-1.5 mm. longi, subreflexi, glabri; perianthium 2 mm. longum, glabrum, basi abrupte in stipitem 1 mm. longum contractum, sepalis obtusis.—British Honduras: Tower Hill, 1928, J. S. Karling 15 (Herb. Field Mus. No. 579,926, type).

Coccocloba reflexiflora closely resembles the common Central American *C. floribunda* (Benth.) Lindau In the latter the pedicels are shorter than the ocreolae.

CHENOPODIACEAE

Suaeda Fernaldii Standl., comb. nov. *Dondia Fernaldii* Standl. N. Amer. Fl. 21: 88. 1916.

Suaeda mexicana Standl., comb. nov. *Dondia mexicana* Standl. N. Amer. Fl. 21: 89. 1916.

Atriplex semibaccata R. Br. - This Australian species, so widely naturalized in the southwestern United States, may now be reported from Mexico. It was collected at Saltillo, Coahuila, in 1928 by C. F. Henderson. The specimens are in the herbarium of Field Museum.

NYCTAGINACEAE

Neea urophylla Standl., sp. nov.—Frutex vel arbor parva, 3-6 m. alta, trunco 2.5-5 cm. diam., ramulis crassis, novellis obscure ferrugineo-tomentulosis; folia ternata, pectiolis 1.5-4 cm. longis, supra late canaliculatis, glabratissimis; limbus ellipticus, late ellipticus, vel oblongo-ellipticus, 28-33 cm. longus, 12-18 cm. latus, apice rotundatus

et abrupte caudato-cuspidatus, acumine e basi deltoidea linearis, attenuato, 2-3 cm. longo, basi obtusus vel acutus, interdum abrupte contractus, papyraceus, fere concolor, supra glaber, nervis prominulis, subtus ad nervos parce puberulus, nervis elevatis, lateralibus utroque latere c. 10, adscendentibus vel divaricatis, arcuatis, prope marginem laxe anastomosantibus; flores feminei cymoso-paniculati, paniculis 2-3 cm. longis et latis, multifloris, pedunculo 1 cm. longo, ferrugineo-puberulo, floribus sessilibus, bracteis lanceolato-oblongis, attenuatis, 1.5 mm. longis; perianthium elliptico-oblongum, 4 mm. longum, parce et minutissime puberulum vel glabratum, ore contracto, minute denticulato, stylo non exserto.—Panama: Daytonia Farm, region of Almirante, 1928, G. P. Cooper 373 (Herb. Field Mus. No. 579,580, type), 545.

Flowers reddish brown. Related to *N. Pittieri* Standl., of Costa Rica and Panama, but in that species the pistillate perianth is 7-8 mm. long.

Neea laetevirens Standl., sp. nov.—Frutex altus vel arbor parva, ramulis gracilibus, parce ferrugineo-puberulis, internodiis 3-4.5 cm. longis; folia ternata vel opposita, petiolis 1-2 cm. longis, minute puberulis vel glabratis; limbus oblongus, elliptico-oblongus, vel obovato-oblongus, saepius supra medium latissimus, apice sub-abrupte acuminatus vel rarius obtusus vel rotundatus et apiculatus, basin versus attenuatus, basi ipsa acuta vel acuminata et saepe obliqua, tenuissimus, in statu sicco laete viridis, untrinque glaber, subtus paullo pallidior, nervis lateralibus utroque latere c. 10, gracillimis, inconspicuis, subtus vix elevatis, prope marginem laxe conjunctis; flores feminei cymoso-paniculati, paniculis multifloris, 5 cm. longis, 7 cm. latis, pedunculo gracili, 4-5.5 cm. longo, ramis primariis 2 cm. longis, puberulis, gracillimis, floribus sessilibus vel pedicellatis, pedicellis ad 2 mm. longis, bracteis lineari-oblongis, 1-1.5 mm. longis; perianthium tubulosum, 2.5-3 mm. longum, parce ferrugineo-puberulum, ore breviter dentato, stylo non exserto. Panama: Permé, San Blas Coast, April 3-10, 1928, G. P. Cooper 639 (Herb. Field Mus. No. 579,225, type).

Inflorescences pendulous; flowers creamy white, washed with red at the tip.

A well-marked species, distinguished by the light green, short petioled leaves, very slender inflorescences, and small flowers.

Oxybaphus suffruticosus Standl., comb. nov. *Allionia suffruticosa* Standl. Contr. U. S. Nat. Herb. 13: 408. 1911.

Oxybaphus longipes Standl., comb. nov. *Allionia longipes* Standl. N. Amer. Fl. 21: 229. 1918.

BERBERIDACEAE

Mahonia longipes Standl., comb. nov. *Odostemon longipes* Standl.
Proc. Biol. Soc. Washington 31: 133. 1918.

Mahonia quinquefolia Standl., comb. nov. *Odostemon quinquefolius* Standl. Proc. Biol. Soc. Washington 31. 133. 1918.

ANNONACEAE

Stenanona Standl., gen. nov.—Arbores parvae, ramulis gracilis, hirsutis; folia brevipetiolata, membranacea, acuminata; flores axillares, solitarii, brevipedicellati; calyx tripartitus, sepalis ovatis, caudato-acuminatis, extus pilosis; petala 6, subaequalia, biseriata, exterioribus in alabastro imbricatis, eximie elongata, anguste linearia; stamina indefinita, claviformia; fructus paucicarpellatus, carpellis sessilibus, subglobosis

Type species, *Stenanona panamensis* Standl

Stenanona panamensis Standl., sp. nov. Arbor 6-metralis, trunco 7.5 cm. diam., ramulis teretibus, dense hirsutis, pilis 1.5-2 mm. longis, fulvis, patentibus, internodiis 1-4 cm. longis; petioli 2-4 mm. longi, hirsuti; limbus oblongus vel obovato-oblongus, 8-18 cm. longus, 2.8-6.5 cm. latus, apice abrupte longiacuminatus, acumine 1-1.8 cm. longo, acuto, basin versus sensim angustatus, basi ipsa rotundata vel leviter cordata, supra viridis, sparse hirsutus, costa impressa, subtus vix pallidior, pilis fulvis patentibus hirsutus, costa gracili, elevata, nervis lateralibus utroque latere c. 12, angulo acuto adscendentibus, leviter arcuatibus, prope marginem laxe conjunctis; flores axillares, solitarii, brevipedicellati, pedicellis ad 5 mm. longis; sepalum ovata, abrupte longiacuminata, 15 mm. longa, basi 5 mm. lata, pilis patentibus fasciculatis extus breviter hirsuta; petala 7 cm. longa, apice c. 6 mm. lata, versus basin sensim dilatata, basi ipsa 5 mm. lata, carnosa, rubescens, statu juvenili molliter pilosula, evoluta sparse et minute pilosula; carpellum fertile 1, ceteris abortivis; bacca subglobosa, 12 mm. diam., sessilis, apice rotundata, sparse strigillosa.—Panama: Daytonia Farm, region of Almirante, 1928, G. P. Cooper 427 (Herb Field Mus. Nos. 579,518, 579,549, type).

The proposed genus is related, apparently, to *Sapranthus*, but from that, as well as from other American genera of Annonaceae, it differs in the remarkably elongate and narrow petals. The description of the recently published *Dichnanona* Diels¹ suggests a similar plant, but in that the flowers are unisexual and much smaller, and the petals valvate.

When the buds of *Stenanona* first open the petals are only 1 cm. long, but they gradually increase in length.

¹Notizbl. Bot. Gart. Berlin 10: 174. 1928

Sapranthus stenopetalus (Donn. Smith) Safford, comb. nov. in herb. *Porcelia stenopetala* Donn. Smith, Bot. Gaz. 40: 1. 1905.

Guatteria aeruginosa Standl., sp. nov.—Arbor 15-metralis, trunco 45 cm. diam., rami crassiusculis, teretibus, dense et breviter ferrugineo-pilosus, internodiis 1.5-2 cm. longis; petioli crassi, vix 2 mm. longi, tomentosi; limbus anguste oblongus vel oblanceolato-oblongus, plerumque supra medium latior, 12.5-16 cm. longus, 4-5.5 cm. latus, abrupte et breviter acuminatus, rarius cuspidato-acuminatus, acumine obtusiusculo, basi obtusus, tenuiter coriaceus, supra puncticulatus, ad costam ferrugineo-pilosus, subtus paullo pallidior, praecipue ad nervos breviter ferrugineo-pilosus, nervis lateralibus utroque latere c. 18, gracillimus, prominulis, fere rectis, prope marginem laxe conjunctis; flores axillares, pedunculis unifloris, crassis, 5 mm. longis, pedicellis 13-18 mm. longis, dense breviterque pilosis; sepala rotundato-ovata, 5 mm. longa, 4 mm. lata, apice obtusa vel rotundata et apiculata, crassa, utrinque sericea; petala exteriora leviter imbricata, late ovata vel elliptica, 8 mm. longa, 5-6 mm. lata, obtusa, crassa, utrinque dense sericea, petalis interioribus brevioribus latioribusque; baccae numerosae, longistipitatae, anguste ellipsoideae, 10-12 mm. longae, 3 mm. crassae, apice et basi acutae, fere glabrae, stipitibus 8 mm. longis, glabratiss.—Panama: Cricamola Valley, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 526 (Herb. Field Mus. No. 579,209, type), 526a.

Vernacular name, "malagueto." A tree with much fluted bole and narrow buttresses. Petals creamy, thick and brittle.

This species may be recognized readily by the narrow leaves, small flowers, and abundant ferruginous pubescence.

Guatteria Slateri Standl., sp. nov.—Arbor mediocris, ad 11 m. alta, rami gracilibus, teretibus, parce sericeis vel glabratiss, internodiis 1.5-3 cm. longis; petioli 1-1.5 cm. longi, graciles, supra profunde canaliculati, glabratii; limbus ellipticus, 14-21 cm. longus, 6-8.5 cm. latus, apice abrupte longiacuminatus, acumine c. 2 cm. longo attenuato, obtuso, basi obtusus, crasse chartaceus, supra obscurae viridis, nitidulus, glaber, nervis vix prominulis, subtus pallidior, brunnescens, statu juvenili cinereo-sericeus, mox glabratiss, nervis lateralibus utroque latere c. 23, prominentibus, leviter arcuatis, prope marginem aequaliter conjunctis; flores axillares, pedunculis unifloris, 5 mm. longis, pedicellis crassis, 1 cm. longis, minute sericeis; sepala rotundato-ovata, apice rotundata, 4 mm. longa et lata; petala exteriora leviter imbricata, late ovata, 8 mm. longa et fere aequilata, apice rotundata, concava, utrinque dense cinereo-sericea, petalis interioribus similibus sed minoribus; stamina numerosa, dense congesta.—Panama: Progreso, Province of Chiriquí, 1927, G. P. Cooper and G. M. Slater 177; Yale No. 10,530 (Herb. Field Mus. No. 573,080, type).

Vernacular name, "malagueto prieto." The wood is coarse and stringy, in color light yellow-tan. It is used in the construction of native houses, but is not very durable.

From *Guatteria amplifolia* Triana & Planch., which is common in some parts of Panama, this tree differs in its relatively broader leaves and small flowers.

Guatteria hypoglauca Standl., sp. nov.—Arbor 9-metralis, omnino glabra, trunco 7.5 cm. diam., ramulis gracilibus, internodiis 2-2.8 cm. longis; petioli crassiusculi, 4-6 mm. longi, teretes; limbus oblongus, 10-14 cm. longus, 4.5-5 cm. latus, apice abrupte et breviter acuminatus, basi rotundatus, tenuiter coriaceus, supra nitidus, nervis prominulis, subtus glaucescens, nervis lateralibus utroque latere c. 6, prominulis, gracillimis, inaequalibus, remote a margine laxe conjunctis; flores axillares, breviter pedicellati, pedicellis 3 mm. longis; petala carnosa, crassa, lutescentia, ovalia vel late elliptica, subaequalia, 17-21 mm. longa, 11-13 mm. lata, apice rotundata, basi obtusa, sessilia.—Panama: Permé, San Blas Coast, April 3-10, 1928, G. P. Cooper 661; Yale No. 12,294 (Herb. Field Mus. No. 579,224, type).

A species easily recognized by the glaucescent under surface of the leaves.

Duguetia panamensis Standl., sp. nov.—Arbor 11-metralis, trunco 15 cm. diam., ramulis gracilibus, teretibus, ochraccis, sparse lepidotis, internodiis 1.5-4 cm. longis; petioli crassi, 3-4 mm. longi; limbus anguste oblongus vel oblanccolato-oblongus, 12.5-22.5 cm. longus, 3.5-5.2 cm. latus, apice abrupte longiacuminatus, acume angusto, obtuso, basi acutus vel abrupte angustatus, subcoriaceus, utrinque nitidulus, supra glaber, costa impressa, subtus sparse lepidotus, costa tenui, elevata, nervis lateralibus utroque latere c. 12, tenuibus, prominentibus, rectis, remote a margine laxe conjunctis; flores axillares, pedunculo 4 mm. longo, incrassato, dense lepidoto, pedicello breviore; carpella juniora glabra, apice acuta vel obtusa; fructus late globoso-ovoideus, 4.5 cm. longus et latus, carpellis numerosis, dense congestis, 8-18 mm. longis, 6-8 mm. crassis, clavatis, sessilibus, apice rotundatis, versus basin cuneatim angustatis, superne dense congestis, 8-18 mm. longis, 6-8 mm. crassis, clavatis, sessilibus dense corrugatis et verrucosis, glabris.—Panama: Daytonia Farm, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 418 (Herb. Field Mus. No. 579,538, type).

A tree with full crown and straight bole. Flowers faintly fragrant, the thick petals yellow. Fruit with a fibrous or woody husk. Wood fragrant.

This is, apparently, the first species of *Duguetia* to be reported from Central America.

Rollinia microsepala Standl., sp. nov.—Ramuli crassi, teretes, cinnamomei, novellis fulvo-sericeis, internodiis brevibus; petioli 6-10 mm. longi, minute sericei; limbus oblongus vel lanceolato-oblongus, 9-14.5 cm. longus, 2.8-4.5 cm. latus, apice acuminatus, acumine acuto, basi obtusus vel acutiusculus, crasse membranaceus, supra glaber, costa impressa, subtus paullo pallidior, sparse et minutissime sericeus, nervis lateralibus utroque latere c. 17, gracilibus, leviter arcuatis vel fere rectis, juxta marginem conjunctis; flores oppositifolii vel interaxillares, fasciculati, pedicellis 10-14 mm. longis, dense et minute sericeis, versus apicem incrassatis, infra medium minute bracteolatis; sepala late ovata vel ovato-deltoidea, acuta, minute sericea, 1.5 mm. longa; corolla dense sericea, alis cuneato-obovatis, leviter adscendentibus, 10-12 mm. longis, ad apicem 5-7 mm. latis, apice late rotundatis, versus basin angustatis.—Panama: Changui-nola Valley, 1927, G. P. Cooper and G. M. Slater 102; Yale No. 10,283 (Herb. Field Mus. No. 573,721, type).

Related to *R. mucosa* (Jacq.) Baill., in which the calyx is much larger.

Rollinia permensis Standl., sp. nov.—Arbor parva 6-metralis, trunco 7.5 cm. diam., ramulis gracilibus, teretibus, fuscis, brunneopuberulis vel breviter pilosulis, internodiis 2.5-4 cm. longis; petioli 8-10 mm. longi, supra canaliculati, adpresso-pilosuli; limbus ellipticus vel oblongo-ellipticus, 13.5-21.5 cm. longus, 5-10 cm. latus, apice abrupte longiacuminatus, acumine obtusiusculo, basi obtusus vel acutiusculus, membranaceus, supra laete viridis, ad nervos minutissime pilosulus, subtus paullo pallidior, sparse et minute sericeus, costa crassa, nervis lateralibus utroque latere c. 11, gracilibus, elevatis, arcuatis, juxta marginem laxe conjunctis; flores oppositifolii, fasciculati, pedunculis brevissimis (in statu fructifero ad 1 cm. longis), pedicellis 5-10 mm. longis (fructiferis ad 2.5 cm.), pilis brevibus ferrugineis adscendentibus pilosulis; sepala late triangularia, acuta, 3.5 mm. longa, utrinque dense sericea; corolla dense cinereo-sericea, alis oblongis, 1 cm. longis, 5 mm. latis, leviter adscendentibus, crassis, apice rotundatis; fructus immaturus subglobosus, 1.8 cm. latus, carpellis numerosis, obtusis, dense sericeis.—Panama: Permé, San Blas Coast, April 3-10, 1928, G. P. Cooper 645; Yale No. 12,278 (Herb. Field Mus. No. 579,230, type).

A small bushy tree with crooked bole.

In Safford's treatment of the genus *Rollinia* (Journ. Washington Acad. 6: 370. 1916) this falls in Group A, of which no Central American species are reported. *R. permensis* is related to the West

Indian *R. mucosa* (Jacq.) Baill., but in that the leaves are narrower, the fewer flowers on longer pedicels, and the wings of the corolla are broadened toward the apex.

MYRISTICACEAE

Dialyanthera acuminata Standl., sp. nov.—Arbor 15-18-metralis, trunco 60 cm. diam., ramulis gracilibus, ochraceis, glabratis, innovationibus sericeis, internodiis 1-1.5 cm. longis; petioli 8-12 mm. longi, graciles, glabri, supra profunde et anguste canaliculati; limbus oblongo-ellipticus, 4.5-9 cm. longus, 2-3.5 cm. latus, apice abrupte falcato-acuminatus, acumine acuto, 1-2 cm. longo, basi obtusus vel abrupte angustatus, crassus, glaber, supra glaucescenti-viridis, minute tuberculatus, subtus brunnescens, rugulosus, nervis lateralibus utroque latere c. 7, obscuris, angulo lato divergentibus, leviter arcuatis; inflorescentiae masculae axillares, solitariae vel binae, dense pilis cinnamomeis tomentulosae, rhachi 1 vel 2 fasciculis florum onusta, fasciculis 3-7-floris, pedicellis flores aequantibus vel brevioribus; perianthium 2 mm. longum, alabastris obtusis.—Panama: Daytona Farm, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 395 (Herb. Field Mus. No. 579,175, type).

Vernacular name, "Saba." A watery red sap runs from the reddish inner bark when it is cut.

Two other species of *Dialyanthera* are known from Panama, *D. otoba* (Humb. & Bonpl.) Warb. and *D. latialata* Pittier, but in both the leaves are several times larger and rounded to short-acuminate at apex.

Virola laevigata Standl., sp. nov.—Ramuli crassi, subteretes, novellis tomentellis, demum glabris, internodiis 1.2-2.5 cm. longis; petioli 5-8 mm. longi, crassi, glabri, supra profunde et anguste canaliculati; limbus oblongus vel anguste oblongus, 13-23 cm longus, 3-6.5 cm. latus, acuminatus, basi obtusus vel acutus et decurrentes, pergamentaceus, supra obscure viridis, glaber, costa subimpressa, subtus brunnescens, statu juvenili minute tomentellus, mox glabratus, nervis lateralibus utroque latere c. 19, gracilibus, paullo elevatis, angulo lato divergentibus, fere rectis vel superioribus arcuatis, juxta marginem conjunctis; inflorescentiae masculae axillares, ramosae, ferrugineo-tomentellae, multiflorae, 8 cm longae, ramulis brevibus, florum fasciculis densis, paucifloris, floribus brevipedicellatis vel fere sessilibus; perianthium 2.5 mm. longum, lobis 3, ovato-oblongis, obtusis, tubum aequantibus, extus fulvo-tomentellis, intus puberulis, alabastris ovoideis, obtusis; antherae 3, oblongae, obtusae, 0.5 mm. longae, connatae, stipitem paullo excedentes.—Panama: Progreso, Province of Chiriquí, 1927, G. P. Cooper and G. M. Slater 308 (Herb. Field Mus. No. 573,062, type).

Vernacular name, "bogamani."

Related to *V. guatemalensis* (Hemsl.) Warb., but in that species the leaves are pale beneath and have more numerous pairs of lateral nerves.

CAPPARIDACEAE

Capparis crotonantha Standl., sp. nov.—Arbor 7.5 m. alta, trunco 7.5 cm. diam., ramulis gracilibus, subteretibus, viridibus, novellis pilis minutis stellatis ferrugineis dense tomentellis, demum glabratris, internodiis 1-2 cm. longis; petioli graciles, 5-9 mm. longi, stellato-tomentelli, supra anguste canaliculati; limbus elliptico-oblongus, 8-12.5 cm. longus, 2.7-5 cm. latus, apice abrupte breviacuminatus, acumine obtuso vel acutiusculo, basi acutus vel obtusus, membraneus, supra viridis, nitidus, nervis prominulis, sparse et minute stellato-puberulus vel glabratus, nervis lateralibus utroque latere c. 8, angulo lato adscendentibus, leviter arcuatis, prope marginem conjunctis; flores paniculati, paniculis terminalibus, 2.5-5.5 cm. longis, pedunculatis, pauciramosis, ramulis pilis stellatis ferruginco-tomentellis, pedicellis 3-7 mm. longis; sepala in alabastro leviter imbricata, oblongo-ovalia, obtusa, 2 mm. longa, stellato-tomentella; petala alba, oblongo-elliptica, 2.5 mm. longa, obtusa, extus pilis albidis tomentella; stamina numerous, filamentis glabris, petala aequantibus vel paullo superantibus, antheris oblongis, glabris, 1 mm. longis; ovarium ovale, 1 mm. longum, apice subtruncatum, gynophoro filamenta aequante; bacca globosa, 5 cm. diam., viridis, laevis, cortice 6-8 mm. crasso, pulpa alba, seminibus 3(?), c. 1.5 cm. crassis.—Panama: Permé, San Blas Coast, April 3-10, 1928, G. P. Cooper 660; Yale No. 12,293 (Herb. Field Mus. No. 579,223, type).

A strikingly distinct species, quite unlike anything known previously from Central America, remarkable because of the minute flowers. In general appearance the plant suggests *Croton glabellus*.

ROSACEAE

Holodiscus pachydiscus (Rydb.) Standl., comb. nov. *Sericotheca pachydisca* Rydb. N. Amer. Fl. 22: 263. 1908.

Holodiscus Schaffneri (Rydb.) Standl., comb. nov. *Sericotheca Schaffneri* Rydb. N. Amer. Fl. 22: 264. 1908.

Holodiscus velutinus (Rydb.) Standl., comb. nov. *Sericotheca velutina* Rydb. N. Amer. Fl. 22: 265. 1908.

Photinia oblongifolia Standl., sp. nov.—Arbor parva vel mediocris, ramulis crassis, fusco-brunneis vel griseis, teretibus, rimosis, novellis dense tomentosis, internodiis brevibus; stipulae lineares vel oblongo-lineares, 4-6 mm. longae, acutae, subscariosae, brunneae, deciduae; petioli crassi, 6-12 mm. longi, densissime tomentosi; limbus oblongus, 6.5-13 cm. longus, 2.5-5 cm. latus, apice obtusus vel

rotundatus, basi obtusus vel subrotundatus, integer vel prope apicem remote serrulatus, coriaceus, primo utrinque dense tomentosus, tomento brunneo-albido, cito deciduo, supra viridis, costa plana paulo impressa, nervis obscuris, subtus vix pallidior, costa elevata, nervis lateralibus utroque latere c. 15, gracilibus, angulo lato divergentibus, fere rectis, prope marginem laxe reticulato-conjunctis, nervulis prominulis, arcu reticulatis; flores corymbosi, corymbis ad apices ramulorum fasciculatis, paucifloris, 10-14 mm. longe pedunculatis, densissime tomentosis, pedunculo adjecto c. 2 cm. longis, pedicellis brevibus, crassis, bracteolis linearibus, calyx multo brevioribus; calyx campanulatus, 3.5-4 mm. longus, dense tomentosus, lobis 5, brevibus, late ovatis, obtusis, intus glabris; petala alba, 2.5-3 mm. longa, orbicularia, sessilia, glabra; stamina pauca, filamentis subulatis, basi dilatatis, glabris; styli 3, glabri, apice dilatati et truncati; ovarium apice dense albo-tomentosum.—Mexico: San Sebastián, trail to El Otatal, Sierra Madre, Jalisco, alt. 1425 m., March 10, 1927, *Ynes Mexia 1860* (Herb. Field Mus. No. 579,915, type).

“Escaramuza.” Wood hard, tough, durable, used for tool handles.

The only other Mexican species of *Photinia* is *P. mexicana* (Baill.) Hemsl., of Veracruz and Oaxaca, which differs in its more lax, appressed-tomentose inflorescence, the tomentum of *P. oblongifolia* being coarse, loose, and easily detachable. In *P. mexicana*, also, the leaves are conspicuously crenate, often acute at base, and on longer, more slender petioles.

LEGUMINOSAE

Inga Englesingii Standl., sp. nov.—Petiolari 3 cm. longi, rhachi 20 cm. longa, tereti, glabra, glandulis parvis sessilibus inter foliola onusta, foliorum paribus 6-8 cm distantibus; foliola 8, petiolulis crassis, 4-5 mm. longis, glabris, limbo elliptico vel elliptico-oblongo, 12-24 cm longo, 6-9 cm. lato, abrupte longiacuminato, acumine angusto, 2-4 cm. longo, acutiusculo, basi obtuso vel acuto et saepe abrupte contracto, membranaceo, glabro, supra obscurc viridi, nitido, nervis prominentibus, subtus pallidiore, costa tenui, elevata, nervis lateralibus utroque latere c. 8, angulo acuto adscendentibus, inaequalibus, remote a margine laxe conjunctis; flores capitati, ad nodos ramorum vetustiorum fasciculati, pedunculis gracillimis, 10-12 mm longis, minute puberulis, paucifloris; calyx tubularis, 3 mm. longus, glaber, breviter dentatus, dentibus triangularibus, acuminate, 0.5 mm. longis; corolla 11 mm. longa, glabra, tubo basi 1 mm., superne 2 mm., crasso, lobis 1.5 mm. longis, late ovatis, obtusis; stamina numerosissima, longe exserta, tubo staminali gracili, 3 mm. exserto.—Nicaragua: Region of Bragman's Bluff, 1928, *F. C. Englesing 205* (Herb. Field Mus. No. 579,732, type).

Calliandra cruziana (Britt. & Rose) Standl., comb. nov. *Anneslia cruziana* Britt. & Rose, N. Amer., Fl. 23: 54. 1928.

Pithecolobium longifolium (Humb. & Bonpl.) Standl., comb. nov. *Inga longifolia* Humb. & Bonpl.; Willd. Sp. Pl. 4: 1010. 1806.

Pithecolobium belicense Standl., nom. nov. *Inga Peckii* Robinson, Proc. Amer. Acad. 49: 502. 1913. *Zygia Peckii* Britt. & Rose, N. Amer. Fl. 23: 39. 1928, not *Pithecolobium Peckii* Blake, 1917.

Pithecolobium scopulinum (Brandeg.) Standl., comb. nov. *Calliandra scopulina* Brandeg. Univ. Calif. Publ. Bot. 10: 183. 1922. *Zygia scopulina* Britt. & Rose, N. Amer. Fl. 23: 40. 1928.

Pithecolobium Recordii (Britt. & Rose) Standl., comb. nov. *Zygia Recordii* Britt. & Rose; Standl. Trop. Woods 7: 6. 1926.

Pithecolobium Conzattii Standl., comb. nov. *Calliandra Conzattii* Standl. Contr. U. S. Nat. Herb. 20: 188. 1919. *Zygia Conzattii* Britt. & Rose, N. Amer. Fl. 23: 40. 1928.

Pithecolobium pseudo-tamarindus Standl., sp. nov.—Arbor inermis 15-18 m. alta, trunco 60 cm. diam., ramulis obtuse angulatis, ferrugineo-tomentellis; folia bipinnata, petiolis 3.5-4 cm. longis, teretibus, prope medium vel supra medium glandulis 3 sessilibus remotis onustis; rhachis folii 14-17 cm. longa, fulvo-tomentella, glandulis sessilibus inter omnes pinnas onusta; pinnae c. 16-jugae, 6-9 cm. longae; foliola c. 40-juga, anguste oblonga, 5-7 mm. longa, 1.8 mm. lata, apice obtusa vel rotundata, basi sessili oblique rotundata, glabra, supra viridia, subtus pallidiora, costa centrali, nervulis prominulis; inflorescentiae, racemosae, pedicellis (statu fructifero) 5-6 mm. longis; calyx 1.5 mm. longus, minute strigillosus, breviter dentatus, dentibus triangularibus, acutis; legumen circinnatum, 10-12 mm. latum, inter semina (3-5) leviter constrictum et spurie septatum, valvis tenuibus, atrobrunnencis, sparse strigillosus vel fere glabris.—Panama: Bocas Island, near Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 461 (Herb. Field Mus. No. 579,411, type).

The local name is "wild tamarind." The tree has low buttresses.

Cashalia panamensis Standl., sp. nov.—Arbor 18-metralis, trunco 38 cm. diam.; folia pinnata, rhachi, petiolo adjecto, c. 12 cm. longa, crassa, supra angusto sulcata, brunneo-tomentosa, petiolulis crassis, nigrescentibus, 4-5 mm. longis; foliola c. 6, lateralibus ovalibus vel late oblongis, terminali ovali-ovato, omnibus apice rotundatis vel obtusissimis, basi late rotundatis, crasse membranaceis, supra viridis, glabratis, nervis non conspicuis, subtus pallidioribus, satis dense et molliter puberulis, costa crassa, elevata, nervis lateralibus utroque latere 11-14, prominentibus, angulo lato divergentibus, leviter arcuatis, prominentibus; flores racemosi, racemis statu fructifero 9 cm. longis, rhachi crassa, brunneo-tomentosa, pedicellis crassissimis, c. 1 cm. longis; legumen sessile, obovoidem, ellipsoideum

vel oblongum, subteres, 5.5-8 cm. longum, apice et basi rotundatum vel obtusum, obtuse tuberculatum, dense brunneo-tomentosum, bivalvatum, valvis crassis; semina 1-2, 2.5 cm. longa, 1.3 cm. lata.—Panama: Holstein Farm, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 520 (Herb. Field Mus. No. 579,373, type).

Local name, "citron." Fruits reddish. The bark has a red sap, which is used as a purgative. The red "skin" of the fruit is used as a febrifuge, and is sold for this purpose in the native drug shops (Collector's notes).

The writer is far from certain that this tree belongs in the genus *Cashalia* (Standl. Journ. Washington Acad. 13: 440. 1923), described from Salvador, but it has been impossible to find any more satisfactory place for it. The fruits are very similar to those of *C. cuscatlanica*, but the leaves are conspicuously different.

Cassia macropoda Standl., comb. nov. *Chamaccrista macropoda* Standl. Contr. U. S. Nat. Herb. 17:431. 1915.

Crudia Choussyana Standl., comb. nov. *Apalatoa Choussyana* Standl. Journ. Washington Acad. Sci. 13: 440. 1923.

Lennea salvadorensis Standl., sp. nov.—Ramuli validi, subteretes; griseo-brunnei, rimosi, lenticellati, novellis ochraccis, pilis minutis brunneis subadpressis sparsis indutis, internodiis brevibus; stipulae lineari-subulatae, 2-3 mm. longae, persistentes, erectae; folia 5.5-15.5 cm. longa, brevipetiolata, rhachi gracili, supra late sulcata, minute adpresso-pilosula; foliola 15-19, opposita vel subopposita, petiolulata, petiolulo 1-2.5 mm. longo, limbo anguste oblongo, oblongo vel (infimo) ovali, 2-6 cm. longo, 0.6-1.5 cm. lato, apice rotundato, basi obtuso, rotundato vel in foliolo terminali acuto, integro, crasse membranaceo, supra griseo-viridi, sparse et minute adpresso-pilosulo vel glabratato, nervulis prominulo-reticulatis, subtus concolor, strigilloso vel glabratato, costa et nervis lateralibus gracilibus, elevatis, nervulis arcte reticulatis, margine plano vel revoluto; racemi subterminales (in statu fructifero), 2-3.5 cm. longi, rhachi crassa, rigida, minute adpresso-pilosula, bracteis anguste triangularibus, persistentibus, adscentibus; legumen subscissile, compressum, 7.5-11 cm. longum, 1.5-2 cm. latum, apice obtusum vel rotundatum et apiculatum, basin versus paullo angustatum, basi ipsa obtusa, sparse pilis brunnescentibus sericeum, valvis crassis.—Salvador: Hacienda Corinto, Zaragoza, July 19, 1928, Salvador Calderón 2394 (Herb. Field Mus. No. 579,825, type).

Vernacular name, "polvo de queso."

Tephrosia arcuata (Rydb.) Standl., comb. nov. *Cracca arcuata* Rydb. N. Amer. Fl. 24: 166. 1923.

Tephrosia platiphylla (Rose) Standl., comb. nov. *Cracca platiphylla* Rose, Contr. U. S. Nat. Herb. 12: 270. 1909.

Tephrosia Watsoniana Standl., comb. nov. *Clitoria scricca* Wats. Proc. Amer. Acad. 22: 407. 1887, not *Tephrosia sericea* DC., 1825. *Cracca Watsoniana* Standl. Contr. U. S. Nat. Herb. 23: 472. 1922.

Tephrosia tepicana Standl., comb. nov. *Cracca tepicana* Standl. Contr. U. S. Nat. Herb. 20: 217. 1919.

Desmodium Painteri (Rose & Standl.) Standl., comb. nov. *Meibomia Painteri* Rose & Standl. Contr. U. S. Nat. Herb. 16: 214. 1913.

Desmodium angustatum (Rose & Standl.) Standl., comb. nov. *Meibomia angustata* Rose & Standl. Contr. U. S. Nat. Herb. 16: 215. 1913.

Desmodium pallidum (Rose & Painter) Standl., comb. nov. *Meibomia pallida* Rose & Painter, Bot. Gaz. 40: 145. 1905.

Desmodium Robinsonii Standl., comb. nov. *Meibomia Robinsonii* Standl. Contr. U. S. Nat. Herb. 23: 486. 1922.

Centrosema heteroneura Standl., comb. nov. *Bradburya heteroneura* Standl. Contr. U. S. Nat. Herb. 18: 106. 1916.

Rhynchosia Pittieri Standl., comb. nov. *Dolicholus Pittieri* Standl. Contr. U. S. Nat. Herb. 17: 433. 1915.

Rhynchosia ixodes Standl., comb. nov. *Dolicholus ixodes* Standl. Contr. U. S. Nat. Herb. 18: 107. 1916.

Rhynchosia tarphantha Standl., sp. nov.—*Suffrutex scandens* 1-4 m. longus, ramosus, ramis crassis, striato-angulatis, densissime pilis brevibus patentibus vel subretrorsis velutino-pilosis, internodiis elongatis; stipulae ovatae, acuminatae, deciduae; folia longipetiolata, 3-foliolata, petiolo 2-4 cm. longo, rhachi 1-1.5 cm. longa, dense pilosa, petiolulis crassis, 4-6 mm. longis; foliola rhombico-orbicularia vel late rhombico-ovata, terminali saepe transverse ovali, 3-7.5 cm. longa, 2.5-8.5 cm. lata, apice obtusa, rotundata vel late rotundata et plerumque abrupte breviterque acuminata, acuminis trianguli, acuto, basi truncata vel rotundata, lateralibus basi inaequabilis, crassa, supra viridia, sericea vel interdum velutino-pilosa, subtus paullo pallidiora, dense breviterque velutino-pilosa, ad nervos sericea, 3-nervia, nervis et nervulis elevatis, arcte reticulatis; racemi capituliformes, 1.5-2 cm. lati, 0.6-2.5 cm. longi, pedunculati, dense multiflori, axillares et solitarii vel subracemosi, pedicellis 1-2 mm. longis; bracteae ovatae vel lanceolatae, alabastris longiores, longi-acuminatae, dense sericeae, deciduae; calyx 10-12 mm. longus, utrinque sericeus, lobis linear-lanceolatis, longiattenuatis, viridibus, reticulato-venosis; petala pallide flavo-viridia, glabra, calycem non superantia.—Mexico: Open slope near stream, San Sebastián. west

of Hacienda del Otatal, Arroyo de los Hornos, Sierra Madre Occidental, Jalisco, alt. 1,500 m., March 4, 1927, *Ynes Mexia 1802* (Herb. Field Mus. No. 579,894, type). Acapulco, 1895, *Palmer 524a*.

Except for its more dense pubescence, the Palmer specimen seems to be identical with the type. The species is well marked by the short dense headlike racemes.

Dalbergia cuscatlanica Standl., comb. nov. *Amerimnon cuscatlanicum* Standl. Journ. Washington Acad. Sci. 13: 442. 1923.

MELIACEAE

Guarea chiricana Standl., sp. nov.—Arbor parva 7.5-11 m. alta, trunco 5-20 cm. diam., ramulis gracilibus, teretibus, ochraceis, novellis breviter patent-pilosus; petioli 3-5.5 cm. longi, rhachi 5.5-9 cm. longa, hirtella, petiolulis crassis, 2-3 mm. longis; foliola 2-3-juga, elliptico-oblonga vel angusti elliptica, 10-22 cm. longa, 4-8.5 cm. longa, apice abrupte caudato-acuminata, acumine obtuso, 2-2.5 cm. longo, basi obtusa vel acutiuscula, membranacea, supra laete viridia, nitidula, ad costam hirtella, nervis prominulis, dense reticulatis, subtus pallidiora, ad nervos sparse hirtella, nervis lateralibus utroque latere c. 14, angulo obtuso adscendentibus, arcuatis, juxta marginem conjunctis, nervulis prominulis, reticulatis; paniculae racemiformes, 3-4 cm. longae, simplices, multiflorae, densae, rhachi sparse hirtella, floribus breviter pedicellatis, pedicellis incrassatis; calyx vix 2 mm. longus, campanulatus, remote et breviter 4-denticulatus, glaber vel ad denticulos parce hirtellus; petala 4, 8 mm. longa, anguste oblonga, obtusa, glabra vel ad apicem sparse hirtella; tubus stamineus cylindricus, glaber, 7 mm. longus; ovarium oblongum, 1.5 mm. longum, parcissime hispidulum, stylo glabro, 4 mm. longo; capsula subglobosa, glabra, sessilis, apice rotundata, 13 mm. longa, obtuse tuberculata. Panama: Progreso, Province of Chiriquí, 1927, G. P. Cooper and G. M. Slater 164; Yale No. 10,517 (Herb. Field Mus. No. 573,073, type), 229 (Yale No. 10,582).

Vernacular names, "mamicillo blanco," "dorita." The wood is used locally for house construction when no better wood is available, and also for implement handles, but it is not considered durable.

Guarea chiricana is related, perhaps, to *G. microcarpa* C. DC. and to *G. Donnell-Smithii* C. DC., but both those species have much smaller flowers.

Cedrela salvadorensis Standl., sp. nov.—Petiole 5.5-7.5 cm. longi, rhachidibus 24-26 cm. longis, tomentosis; foliola 15-17, opposita, petiolulis 2-3 mm. longis, dense breviterque pilis brevibus pilosis, limbis ovato-oblongis, 8-11 cm. longis, 3.5-5 cm. latis, abrupte acuminatis, basi oblique rotundatis, supra praeccipue ad nervos hirtellis, subtus molliter denseque pilosulis, nervis lateralibus pro-

minentibus, utroque latere c. 17, leviter curvatis; capsula longipedicellata, anguste obovoidea, versus basin angustata, apice obtusa, 9.5 cm. longa, valvis 2.5 cm. latis, 7 mm. crassis.—Salvador: Near Chalchuapa, 1922, *Salvador Calderón* 1007 (U. S. Nat. Herb. No. 1,151,973, type).

Although known only from incomplete material, this *Cedrela* is evidently distinct in the large capsules and densely pubescent leaflets. The vernacular name is "cedro macho."

Trichilia breviflora Blake & Standl., sp. nov.—Frutex 3 m. altus, ramulis gracilibus, teretibus, sordide puberulis, internodiis 1-3.5 cm. longis; folia unifoliolata, petiolis c. 1 cm. longis, gracilibus, puberulis, supra late canaliculatis, petiolulis 2-4 mm. longis; foliola oblonga vel obovato-oblonga, 8.5-13.5 cm. longa, 3.5-5.5 cm. lata, apice abrupte breviterque acuminata, acumine lato, obtuso, basi acuta, chartacea, supra laete viridia, ad costam sparse puberula, subtus brunnescens, ad nervos sparse puberula, nervis lateralibus gracilibus, utroque latere 10-12, divaricatis, leviter arcuatis, remote a margine irregulariter anastomosantibus; paniculae axillares et terminales, 2.5-5.5 cm. longae, 1.2-3 cm. latas, multiflorae, longipedunculatae, pedunculis 1-3 cm. longis, ramulis sparse puberulis, floribus breviter pedicellatis, pedicellis validis, vix 1 mm. longis; calyx strigillosus, c. 0.7 mm. longus, dentibus 4-5, brevibus, late deltoideis, acutiusculis; petala 4-5, superne sparse strigillosa, 1.5 mm. longa; antherae 4-5, obtusae, glabrae, 0.7 mm. longae, filamentis brevissimis, in apice tubi staminei brevis insertis, dentibus triangularibus, interdum bidentatis, apice minute hispidulis interpositis; ovarium dense hispidulum, 2-loculare, ovulis 2, collateralis; stylus brevissimus, glaber.—Honduras: In rich wet soil in deep jungle at sea level, near Tela, Dept. of Atlántida, April 7, 1926, *Elizabeth R. Mitchell* 96 (U. S. Nat. Herb. No. 1,269,751, type).

A very distinct species because of the unifoliolate leaves and minute flowers.

BURSERACEAE

Tetragastris Stevensonii Standl., sp. nov.—Arbor, ramulis crassis, subteretibus, brunnescensibus vel ochraccis, lenticellatis, lenticellis elevatis; folia pinnata, petiolo 5.5-10 cm. longo, gracili, supra plano, subtus obtuse carinato, glabro, rhachi 5-9 cm. longa, foliolorum paribus 2-4 cm. distantibus; foliola 7, opposita, petiolulo 4-7 mm. longo, crasso, limbo oblongo vel lanceolato-oblongo, 6.5-12 cm. longo, 2.5-4 cm. lato, longiacuminato, acumine angusto, obtuso, 1-2 cm. longo, basi obtuso vel acutiusculo, integro, subcoriaceo, glabro, nervis supra prominentibus, costa subtus elevata, crassa, nervis lateralibus utroque latere c. 11, angulo lato divergentibus, leviter arcuatis, tenuibus, elevatis, prope marginem laxe conjunctis; paniculae axillares, fasciculatae, multiflorae, pedunculatae vel c basi ramosae, ad 18 cm. longae, ramis sparse et minute puberulis vel

glabratiss, pedicellis crassis, 1-2 mm. longis, puberulis; calyx late campanulatus, 2.5 mm. latus, 1.5 mm. longus, minute et sparse puberulus, brevissime lobatus, lobis late rotundatis; corolla anguste campanulata, 5 mm. longa, extus minute puberula, tubo basi 2 mm., sauce 3 mm., lato, lobis oblongo-ovatis, tubo brevioribus, erectis, obtusis, apice recurvis; stamina 1-2 mm. longa.—British Honduras: In 1928, Neil S. Stevenson 9 (Herb. Field Mus. No. 579,768, type).

The only species of *Tetragastris* known from Central America is *T. panamensis* (Engler) Kuntze, of Panama, which differs in having much smaller flowers.

Bursera Oerstedii Standl., comb. nov. *Elaphrium Oerstedii* Standl. Journ. Washington Acad. Sci. 17: 521. 1927.

Bursera biflora (Rose) Standl., comb. nov. *Terebinthus biflora* Rose, Contr. U. S. Nat. Herb. 10: 119. 1906.

Bursera longipedunculata (Rose) Standl., comb. nov. *Elaphrium longipedunculatum* Rose, N. Amer. Fl. 25: 254. 1911.

Bursera queretarensis (Rose) Standl., comb. nov. *Elaphrium queretarensis* Rose, N. Amer. Fl. 25: 254. 1911.

Bursera subtrifoliata (Rose) Standl., comb. nov. *Terebinthus subtrifoliata* Rose, Contr. U. S. Nat. Herb. 10: 122. 1906.

Bursera longipes (Rose) Standl., comb. nov. *Terebinthus longipes* Rose, Contr. U. S. Nat. Herb. 10: 120. 1906.

Bursera arida (Rose) Standl., comb. nov. *Terebinthus arida* Rose, Contr. U. S. Nat. Herb. 10: 118. 1906.

Bursera pubescens (Schlecht.) Standl., comb. nov. *Elaphrium pubescens* Schlecht. Linnaca 16: 527. 1842.

Bursera pubescens Wats. (Proc. Amer. Acad. 24: 44. 1889) belongs in another family, being a synonym of *Veatchia discolor* var. *pubescens* (Wats.) I. M. Johnston.

Bursera tecomacea (DC.) Standl., comb. nov. *Amyris tecomacea* DC. Prodr. 2: 82. 1825.

EUPHORBIACEAE

Caryodendron angustifolium Standl., sp. nov.—Arbor 4.5-6-metralis, practer inflorescentiam glabra, trunko 5-7.5 cm. diam., ramulis crassis, teretibus, viridibus, internodiis 2-8 cm. longis;

petioli 1.2-3 cm. longi, validi; limbus anguste oblanceolato-oblongus, 19-26 cm. longus, 5-7 cm. latus, integer, cartilagineo-marginatus, breviter acuminatus, acumine lato, rotundato vel emarginato, versus basin cuneatam sensim angustatus, supra prope basin biglandulosus, supra viridis, opacus, minutissime punctulatus, costa et nervis lateralis prominentibus, subtus paullo pallidior, costa crassa, elevata, nervis lateralibus utroque latere c. 7, angulo acuto adscendentibus, juxta marginem conjunctis; spicae masculinae paucae, 4-20 cm longae, paniculam terminalem efformantes, rhachi crassa, parce strigillosa, e basi florifera; bracteae latissime triangulares, rotundatae, strigilosae et ciliolatae, dense multiflorae; flores sessiles, vix 2 mm. longi, alabastris subglobosis, glabris; sepala late ovata, obtusa; stamina plerumque 7, antheris ovalibus, connectivo obtuso.—Panama: Progreso, Province of Chiriquí, 1927, G. P. Cooper and G. M. Slater 192; Yale No. 10,547 (Herb. Field Mus. No. 573,129, type).

The genus *Caryodendron* has not been reported previously from North America. Two other species are known, *C. grandifolium* (Muell.) Pax, of Brazil, and *C. orinocense* Karst., of Colombia. The Panama tree is related to *C. grandifolium*, but in that the leaves are proportionately broader, the spikes more slender, and the flower clusters smaller.

Cleidion denticulatum Standl., sp. nov.—Arbor 9-metralis, trunko 20-25 cm. diam., ramulis teretibus, ferrugineo-brunneis, minute strigilosis vel demum glabratis, internodiis 2-4 cm. longis; petioli crassi, 6-10 mm. longi, strigilos; limbus oblanceolato-oblongus vel anguste oblongo-oblanceolatus, 14.5-36 cm. longus, 3-8 cm. latus, apice breviter cuspidato-acuminatus, acumine 1 cm. longo, obtuso, versus basin sensim angustatus, basi ipsa cuneato-acuta, crassc pergamantaceus, remote sinuato-denticulatus vel basin versus integer, supra viridis, nitidulus, glaber, costa et nervis lateralibus prominentulis, subtus paullo pallidior, sparse strigilosus, nervis lateralibus utroque latere 6-8, prominentibus, angulo acuto adscendentibus, leviter curvatis, juxta marginem conjunctis, nervulis prominentulis, flores feminei racemosi, racemis axillaribus, paucifloris, 5-7 cm. longis vel longioribus, pedicellis statu fructifero crassis, c. 3 mm. longis; calyx profunde lobatus, extus adpresso-pilosulus; capsula (perfecta non visa) c. 12 mm. longa, tricocca, elastice loculicida, strigillosa; semina subglobosa, 8 mm. longa, 7 mm. lata, castanea, maculis ochraceis conspersa, ecarunculata.—Panama: Buena Vista Camp, Chiriquí Trail, alt. 375 m., 1928, G. P. Cooper 606; Yale No. 12,239 (Herb. Field Mus. No. 579,650, type).

Because of incomplete material, the generic position of this plant is very uncertain, but in general appearance it agrees well with material referred to *Cleidion nicaraguense* Hemsl. That species differs in having coarsely sinuate-crenate leaves, with much fewer teeth, and with spreading pubescence.

Tetrorchidium euryphyllum Standl, sp. nov.—Arbor 9-metralis, trunco 10 cm. diam., ramulis crassulis, obtuse angulatis, viridibus, dense strigilosis, internodiis brevibus; petioli 2-5-3-5 cm. longi, validi, supra canaliculati, dense strigilosi, subtus ad apicem biglandulosi, glandulis conicis; limbus late ellipticus, 17-21 cm. longus, 10-13 cm. latus, apice rotundatus et breviter acuminatus, acumine 5-10 mm. longo, triangulari, obtuso, basi obtusus et abrupte breviterque decurrentes, remote et minute supra medium denticulatus, membranaceus, supra laete viridis, minute strigilosus, nervis non conspicuis, subtus paulo pallidior, strigilosus, costa crassiuscula, elevata, nervis lateralibus utroque latere 6, arcuatis, tenuibus, juxta marginem laxe conjunctis; racemi feminei laxe pluriflori, axillares, geminati vel solitarii, 3.5-6 cm. longi, pedunculati, rhachi dense fulvescenti-strigosa, pedicellis 1-2.5 mm. longis; sepala 3, ovato-deltoidea, acuta; discus hypogynus carnosus, integer; ovarium glabrum, 2-loculare, ovulis in loculis solitariis; capsula juvenilis 5 mm. lata, 4 mm. alta; styli breves, crassi, obscure bilobati.—Panama: Buena Vista Camp on Chiriquí Trail, alt. 450 m., 1928, G. P. Cooper 621 (Herb. Field Mus. No. 579,643, type).

The generic position of this tree is not altogether certain, but it seems to agree best with *Tetrorchidium*, and does not differ in any important character. Because of the glabrous ovary it would run at once in Pax's key (in Engl. Planzenreich IV 147⁴: 30. 1912) to *T. andinum* Muell., a Peruvian species of which I have seen no material. The Peruvian tree is described as having oblong-elliptic or oblong-obovate, coarsely dentate leaves which are glabrous except on the nerves.

Pausandra extorris Standl, sp. nov.—Ramuli novelli 8 mm. crassi, dense foliati, sulcati, dense pilis brevibus dibrachiatis pilosi; petioli 4 mm. crassi, 2-2.5 cm. longi, striati, breviter adpresso-pilosii; limbus anguste spatulato-obovatus, 36-47 cm. longus, 9-15 cm. latus, apice acuminatus vel rotundatus et breviter cuspido-acuminatus, versus basin longe attenuatus, basi ipsa biglandulosus, glandulis crassis, conicis, acutis, sessilibus, 2 mm. longis, tenuiter coriaceus, in toto margine serrato-dentatus, dentibus 8-22 mm. distantibus, supra viridis, glaber, nervis elevatis, subtus pallidior, sparse pilis brevibus dibrachiatis adpressis pilosus, costa gracili, elevata, nervis lateralibus utroque latere c. 30, angulo lato divergentibus, leviter arcuatis, gracilibus, prominentibus, parallelis, juxta marginem conjunctis, spicae masculinæ axillares, solitariae, breviter pedunculatae, 7-10.5 cm. longæ, rhachi crassa, dense adpresso-pilosula, remotiflora; alabastra 1.5 mm. longa, calyce minute adpresso-pilosula.—Nicaragua: Region of Bragman's Bluff, 1928, F. C. Englesing 216 (Herb. Field Mus. No. 579,728, type).

Only four other species of *Pausandra* are known, all of them natives of South America. *P. extorris* is related to *P. Morisiana*

(Casar.) Radlk., of Brazil, but in that the leaves are smaller, the petioles longer, and the lateral nerves of the leaves only 20.

Euphorbia Mexiae Standl., sp. nov.—Herba laticifera 3-4 m. longa, subscandens, caulis gracilibus, 0.5-2.2 mm. crassis, teretibus, glabris, ramis adscendentibus, internodiis elongatis; folia inferiora alterna, superiora opposita, longipetiolata, petiolo capillari, 2-20 mm. longo, glabro vel rarius sparse villosi; limbus ovatus vel elliptico-ovatus, 15-25 mm. longus, 9-15 mm. latus, foliis ramealibus 3-7 mm. longis, apice acutus vel obtusus, basi aequali rotundatus, integer, tenuis, utrinque sparse pilis albidis gracillimis villosulus vel glabratius, supra viridis, subtus paullo pallidior, costa gracillima, nervis lateralibus utroque latere 5-6, obscuris, curvatis; stipulac glanduliformes; involucra axillaria, solitaria, 2 mm. longe pedicellata, turbinato-campanulata, 2 mm. longa, basi acutiuscula nuda, viridia, adpresso-pilosula, lobis brevissimis, laciniatis, glandulis in lobos lineares albos apice paullo dilatatos dissectis; ovarium glabrum; capsula 5 mm. longe stipitata, glabra, 2 mm. alta, 3 mm. lata; semina non visa.—Mexico: In woods on mountain side, Santa Cruz de Vallarta, Jalisco, alt. 700 m., Dec. 10, 1926, *Ynes Mexia* 1272 (Herb. Field Mus. No. 579,892, type).

Vernacular name, "herba de arlomo."

ANACARDIACEAE

Rhus allophyloides Standl., sp. nov.—Frutex 3-metralis, ramulis validis, teretibus, pallide cinnamomeis, dense pilis inaequalibus brunnescens velutino-pilosis, internodiis elongatis; folia alterna, trifoliolata, petiolo 2.5-4.5 cm. longo, valido, subtereti, dense piloso, foliolis lateralibus sessilibus vel subsessilibus, foliolo terminali 5-12 mm. longe petiolulato; foliola oblongo-ovata, ovata vel rhombico-ovata, 4-11 cm. longa, 2-6.5 cm. lata, acuta vel acuminata, basi rotundata, obtusa vel (terminalia) cuncato-acuta, grosse crenato-dentata, dentibus inaequalibus, acutis vel obtusis, crassa, supra viridia, hispido-pilosa, nervis paulo elevatis, subitus pallida, dense velutino-pilosa, costa crassa, elevata, nervis lateralibus utroque latere 8-11, adscendentibus, prominentibus, leviter arcuatis vel rectis, percurrentibus; flores paniculati, paniculis axillaribus et terminalibus, dense multifloris, 3-5 cm. longis, pauciramosis, bracteis imbricatis, rotundatis vel late ovatis, apice rotundatis vel obtusis, inferne minute pilosulis; sepala ovali-ovata, obtusa, glabra; petala alba, glabra, 2.5 mm. longa; drupa subcompressa, orbicularis, 4-5 mm. longa, nitida, pilosa.—Mexico: Near stream in thicket on steep hillside, trail from San Sebastián to Real Alto, Sierra Madre Occidental, Jalisco, alt. 2,000 m., February 4, 1927, *Ynes Mexia* 1640 (Herb. Field Mus. No. 579,804, type). Thicket along shady stream bank, Real Alto, trail to Arroyo de las Canelillas, Jalisco, alt. 2,500 m., *Mexia* 1729 (U. S. Nat. Herb.).

Evidently related to *R. terebinthifolia* Schlecht. & Cham., but in that species the leaflets are usually 5-15, and the panicles large and lax.

AQUIFOLIACEAE

Ilex berberidifolia Standl., sp. nov.—Arbor parva, ramulis subteretibus, obscure griseo-brunneis, internodiis brevibus; folia decidua, in apicibus ramulorum valde abbreviatorum congesta; petioli 1.5-2 mm. longi, glabratii; limbus oblongo-ellipticus vel oblongo-obovatus, 13-20 mm. longus, 5-9 mm. latus, apice rotundatus vel obtusus et saepe emarginatus, basi acutus vel rarius obtusus, supra medium remote adpresso-crenatus, tenuis, supra obscure viridis, glabratii, subius pallidior, statu juvenili adpresso griseo-pilosus, mox glabratii; flores fasciculati, longipedicellati, pedicellis 7-9 mm. longis, gracilibus, glabris; calyx 2 mm. latus, glaber, breviter 4-lobatus, lobis apice obtusis vel rotundatis; petala ochroleuca, obovato-elliptica, 3 mm. longa, apice rotundata, glabra; filamenta 2 mm. longa, crassa, antheris late oblongis, 1 mm. longis—Mexico: Widespread on mountain tops, Santa Rita Ranch, Tamaulipas, alt. 1,500 m., April 8, 1926, Robert Runyon 878 (U S. Nat. Herb. No. 1,315,866, type).

In general appearance this *Ilex* suggests *I. vomitoria* Ait., but in that the persistent leaves are obtuse or rounded at base, and the pedicels are much shorter.

Ilex panamensis Standl., sp. nov.—Arbor mediocris, omnino glabra, ramulis crassiusculis, ochraceis, internodiis brevibus; petioli crassi, 4-6 mm. longi, supra late canaliculati; limbus oblongus vel anguste elliptico-oblongus, 6-10 cm. longus, 2.3-3.5 cm. latus, apice obtusus vel rotundatus, basi obtusus vel acutiusculus, subcoriaceus, supra obscure viridis, nitidus, nervis non elevatis, subitus opacus, nervis lateralibus tenuissimis, inconspicuis, utroque latere c. 10, irregularibus, angulo obtuso divergentibus, prope marginem laxe anastomosantibus; flores seminei axillares, pauci, fasciculati, pedicellis 4-5 mm. longis, crassiusculis; calyx fere 2 mm. latus, breviter 5-lobatus, lobis latis, obtusissimis; drupae globosae, 3-3.5 mm. diam., apice late rotundatae.—Panama: Bocas Island, near Almirante, 1928, G. P. Cooper 469 (Herb. Field Mus. No. 579,403, type).

Only one species of *Ilex*, *I. occidentalis* Macfad., has been reported from Panama, and the identity of the specimens so reported (from Ancón Hill) is problematical, since no similar plant has been found recently in Panama. *Ilex panamensis* is not related to *I. occidentalis*, nor does it bear any close relationship to any of the species described by the writer¹ from Costa Rica.

¹See Journ. Washington Acad. Sci. 16: 481. 1926.

The local name of *Ilex panamensis* is "garlic wood." The tree is 12 m. high, with a trunk 30 cm. in diameter, the bole sometimes excentric. The wood is creamy flat white when cut, but almost immediately on exposure it turns greenish gray.

HIPPOCRATEACEAE

Salacia megistophylla Standl., sp. nov.—*Frutex scandens glaber, ramulis teretibus, 5 mm. crassis, elevato-lenticellatis, ad nodos incrassatis; folia opposita, petiolo crasso, supra profunde et anguste sulcato, 18 cm. longo; limbus oblongus vel lanceolato-oblongus, 34-36 cm. longus, 14 cm. latus, breviter acuminatus, acumine obtusiusculo, triangulari, basi rotundatus, subcoriaceus, integer, supra nitidus, costa paullo elevata, nervis vix elevatis, subtus opacus, corrugulatus, fere concolor, costa crassa, elevata, nervis lateralibus utroque latere c. 9, angulo acuto adscendentibus, arcuatis, marginem revolutam fere attingentibus; pedicelli fructiferi lignosi, crassi, 3-3.5 cm. longi; fructus globosus, 6 cm. diam., basi et apice rotundatus, brunnescens, glaber*—Panama: Cricamola Valley, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 503 (Herb. Field Mus. No. 579,427, type).

The species is well marked by the very large leaves and large fruits.

ICACINACEAE

Discophora panamensis Standl., sp. nov.—*Arbor 9-metralis, trunco 10 cm. diam., ramiculis gracilibus, teretibus, laevibus, viridibus, minute puberulis, internodiis 1.5-2 cm. longis; folia alterna, petiolis 1-1.5 cm longis, supra anguste et profunde canaliculatis, dense et minute puberulis; limbus oblongus, 13-17 cm. longus, 4-5.5 cm. latus, abrupte breviterque acuminatus, acumine 7-10 min. longo, obtuso vel acutiusculo, basi obtusus vel acutus, integer, membranaceus, supra lacte viridis, glaber, costa et nervis lateralibus impressis, subtus pallidior, ad nervos et interdum in tota superficie sparse puberulus, costa crassa, elevata, nervis lateralibus utroque latere 7-8, tenuibus, angulo acuto adscendentibus, leviter arcuatis, juxta marginem conjunctis; flores albi, cymosi, cymis axillaris, sessilibus vel pedunculatis, laxe multifloris, 2-3 cm. longis et latis, ramiculis puberulis, floribus sessilibus vel breviter pedicellatis; calyx 0.7 mm. longus, glaber, subinteger; petala ovato-oblonga, 1.5 mm. longa, valvata, obtusa, glabra, intus unicostata; stamina petalis paullo longiora, filamentis crassis, supra basin dense pilis albis barbatis, infra antheras angustatis et glabris, antheris ovatis, 0.5 mm. longis, obtusis, glabris; ovarium glabrum*—Panama: Buena Vista Camp on Chiriquí Trail, alt. 375 m., 1928, G. P. Cooper 613; Yale No. 12,246 (Herb. Field Mus. No. 579,637, type).

Only one other species, *Discophora guianensis* Miers, is known in this genus of the Icacinaceae. That tree, of Brazil and the Guianas, differs in having larger coriaceous leaves and much stouter branches of the inflorescence.

SAPINDACEAE

Cupania asperula Standl., sp. nov.—Arbor 14.5 m. alta, trunco 18 cm. diam., ramis crassis, teretibus, sulcatis, dense pilis longiusculis patentibus vel adscendentibus fulvis pilosis, internodiis brevibus; folia pinnata, petiolo 5-6 cm. longo, subtereti, dense piloso, rhachi 7-8.5 cm. longa, foliolorum paribus 3.5-4 cm. distantibus, foliola 6-8, subopposita, petiolulo crasso, 3-5 mm. longo, dense piloso, limbo anguste oblongo vel oblanceolato-oblongo, 7-16 cm. longo, 3-5.5 cm. lato, apice obtuso vel rotundato et breviter apiculato, versus basin obtusam angustato, coriaceo, remote serrulato, dentibus breviter mucronatis, margine revoluto, supra pallide viridi, sub-bullato, nitido, puberulo vel minute hirtello, costa prominente, nervis lateralibus impressis, nervulis prominulis, subtus brunnescente, hirtello, costa valida, elevata, nervis latcratalibus utroque latere c. 10, angulo lato adscendentibus, arcuatiss, percurrentibus, nervulis prominentibus, arcte reticulatis; flores racemoso-paniculati, paniculisi axillaris, pedunculatis, 25 cm. longis, ramulis paucis, 4-8 cm. longis, dense multifloris, molliter fulvo-pilosus; bracteae lineares, 4-6 mm. longae, patentes, breviter pilosae; pedicelli ad 3 mm. longi; calycis lobi oblongi, obtusi, 3 mm. longi, extus dense breviterque pilosi; capsula triquetra, brevistipitata, 20-24 mm. lata, 14 mm. longa, dense pilis fulvis hirtella, lobis compressis, valvis intus sparse hirtellis.—Nicaragua: Region of Bragman's Bluff, March 30, 1928, F. C. Englesing 176 (Herb. Field Mus. No. 579,724, type).

"Cola de pavo." "Bilabila" (Mosquito dialect). A small tree in thick forest near Camp No. 23, in heavy clay soil. Capsule dark maroon. Wood yellow, with spicy-peppery odor. Said to be used by the Indians for canoe paddles.

Cupania Cooperi Standl., sp. nov.—Arbor 11-metralis, trunco 25 cm. diam., ramulis crassis, subteretibus, fulvo-tomentosis vel demum glabratis, internodiis brevibus; petioli 3-7 cm. longi, rhachi 5-10 cm. longa, subtereti, dense hirtella, petiolulis 2-4 mm. longis; foliola 4-6, oblanceolato-oblonga vel oblongo-ovovata, inaequalia, infimis brevioribus, 9-21.5 cm. longa, 4-7.5 cm lata, apice abrupte breviacuminata, rarius obtusa, basi acuta vel cuneatim angustata, remote adpresso-serrata, versus basin integra, rarius dentibus salientibus apiculatis serrata, supra viridia, ad nervos hirtella vel puberula, subtus paullo pallidiora, hirtella, costa et nervis lateralibus prominentibus, nervis utroque latere c. 11, adscendentibus, arcuatiss, in dentos percurrentibus; paniculæ axillares, solitariae vel fasciculatae, 5-15 cm. longae, pauciramosæ, multifloræ, ramulis dense fulvo-toinen-

tosis, pedicellis 1-1.5 mm. longis; bracteac 2-3 mm. longac, lineari-lancolatae, patulae, acutac, extus tomentellac, persistentes; sepala ovalia, obtusa, 2 mm. longa, extus dense adpresso-pilosula; petala obovata, ochroleuca, sepalis vix longiora, apice rotundata, ciliolata; filamenta pilosula, superne glabra, petala aquantia, basi dilatata, antheris late oblongis, albis, glabris; ovarium dense pilosum, stylo crasso, petalis longiore, stigmatibus recurvatis.—Panama: Daytonia Farm, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 543b (Herb. Field Mus. No. 579,684, type), 543, 543a.

Among the Central American species of *Cupania* this may be recognized by the few acuminate leaflets, with spreading pubescence.

Matayba ingaefolia Standl., sp. nov.—Arbor 7.5 m. alta, trunco 10 cm. diam., ramulis gracilibus, teretibus, parce lenticellatis, minute tomentellis vel glabratis, internodiis 1.2-2.5 cm. longis; folia 4-foliolata, petiolo 1.5-3 cm. longo, gracili, rhachi 1.5-2.5 cm. longa, supra canaliculata, sparse et minute puberula, petiolulis 2.5-4 mm. longis; foliola lanceolata vel anguste lanceolato-oblonga, 5-14 cm. longa, 1.5-4.5 cm. lata, longe et anguste acuminata, acumine obtuso vel acutiusculo, basi obtusa, crasse membranacea, integra, supra griseo-viridia, glabra, costa paullo elevata, subtus viridia, ad nervos sparse et minute puberula vel fere omnino glabra, costa valida, nervis lateralibus utroque latere 6-7, elevatis, angulo acuto adscendentibus, leviter arcuatis, prope marginem laxe conjunctis; paniculae axillares, racemiformes, foliis longiores, longipedunculatae, c. 13 cm. longae, laxe multiflorae, ramulis puberulis, pedicellis 3-5 mm. longis; capsula immatura didymo-globosa, sessilis, 7-9 mm. lata, 6-7 mm. alta, bilocularis, loculis saepe inaequalibus, dense brunneo-tomentella.—Panama: Buena Vista Camp on Chiriquí Trail, alt. 900 m., 1928, G. P. Cooper 597; Yale No. 12,230 (Herb. Field Mus. No. 579,613, type).

RHAMNACEAE

Rhamnidium caloneurum Standl., sp. nov. Arbor 2.3 m. alta, trunco 30 cm. diam., ramulis gracilibus, subteretibus, atrobrunneis, obscure puberulis vel glabratis, internodiis 2-3 cm. longis; folia opposita, petiolis 8-11 mm. longis, gracilibus, sparse puberulis vel glabratis; limbus ellipticus vel elliptico-oblongus, 6-11 cm. longus, 3-4.5 cm. latus, apice abrupte acuminatus, acumine c. 1 cm. longo, obtuso, mucronato, basi obtusus vel rotundatus, chartaceus, supra viridis, nitidus, glaber, nervulis transversis prominulis, subtus pallidus, ad nervos sparse puberulus, costa elevata, tenui, nervis lateralibus utroque latere c. 13, prominentibus, parallelis, arcuatis, adscendentibus, marginem attingentibus, margine revoluto; cymae unihelli-formes, axillares, pauciflorae, pedunculo 6 mm. longo, pedicellis crassis, 5-7 mm. longis, sparse puberulis vel glabratis; calyx 6 mm. latus, glaber, lobis 5, triangularibus, acutis, patentibus; bacca

subglobosa, 1 cm. longa et fere aquilata, basi et apice rotundata, laevis, glabra; semen 1, compressum.—Panama: Daytonia Farm, region of Almirante, 1928, G. P. Cooper 434 (Herb. Field Mus. No. 579,347, type).

A tall tree with long clear hole and no buttresses. Twigs fine and much branched. Fruit greenish red. The wood takes a good polish; it has the odor of peanuts.

The genus *Rhamnidium* has not been reported previously from continental North America. The other species are West Indian and South American.

Colubrina panamensis Standl., sp. nov.—Arbor 7.5-12 m. alta, trunco 10-30 cm. diam., ramulis crassis, subteretibus, ferrugineo-brunneis, novellis cinnamomeo-sericeis, mox glabratiss, internodiis 1-5 cm. longis; petioli 1-1.8 cm. longi, graciles, primo sericei, cito glabri; limbus ellipticus vel elliptico-oblongus, rarius obovato-oblongus, 11.5-21 cm. longus, 4.5-8.5 cm. latus, abrupte breviacuminatus, acumine obtuso, basi rotundatus vel obtusus, interdum abrupte contractus, subtus basi insima biglandulosus, membranaceus, integer, supra laete viridis, glaber, costa impressa, subtus pallidior, ad nervos adpresso-pilosus vel glabratiss, costa gracili, elevata, nervis lateralibus utroque latere c. 10, adscendentibus, leviter curvatis, prope marginem laxe conjunctis; flores axillares, fasciculati, pedicellis 2-4 mm. longis, gracilibus, adpresso-pilosulis vel glabratiss, statu fructifero ad 10 mm. longis; calyx 1.2 mm. longus, lobis triangularibus, acutis, fere glabris; petala cucullata, obtusa, glabra, calyce longiora; drupa subglobose, 8 mm. lata, glabra, apice late rotundata, apiculata, parietibus tenuibus. Panama: Farm 8, near Almirante, 1928, G. P. Cooper 111 (Herb. Field Mus. No. 579,204, type). Daytonia Farm, region of Almirante, Cooper 456. Almirante region, Cooper 365. Costa Rica: Guapiles, alt. 300-500 m., Standley 37,235. Finea Monterristo, alt. 25 m., Standley and Valerio 48,405. Carmen Station, alt. 30 m., Standley and Valerio 48,370.

Known in Panama as "pichypang" and "wild coffee." A tree with low divided trunk, the hole fluted and twisted. Wood used for firewood.

From Panama there are known two other species of *Colubrina*, *C. heteroneura* (Griseb.) Standl., and *C. rufa* Reissek, neither of which is closely related to the plant here described.

VITACEAE

Cissus biformifolia Standl., sp. nov.—Frutex scandens cirrhosus, ramis crassis, obtuse tetragonis, striatis, atrobrunneis, glabratiss, minute elevato-lenticellatis, internodiis elongatis; folia ramorum

sterilium longipetiolata, petiolo 4.5 cm. longo, limbo deltoideo-cordato, 13 cm. longo, 10 cm. lato, apice rotundato-obtuso, basi late breviterque cordato, remote et adpresso dentibus apiculatis sinuato-serrato, glabro, 7-nervio, nervis lateralibus utroque latere 5-6, gracilibus, fere rectis, percurrentibus; folia ramorum florigerorum longipetiolata, petiolis gracilibus, 3-3.5 cm. longis, limbo lanceolato, 5-8.5 cm. longo, 1.5-3 cm. lato, versus apicem acutiusculum attenuato, remote sinuato-serrato vel integro, basi 3-nervio; cymae oppositifoliae, 5-7 mm. longo pedunculatae, pedunculis crassis, ramulis paucis, 5-9 mm. longis, minute et sparse puberulis, floribus breviter pedicellatis; calyx 1.5 mm. longus, rotato-campanulatus, breviter 4-lobatus, glaber; petala 4, glabra, 4 mm. longa, oblonga, obtusa.—Panama: Changuinola Valley, Jan. 11, 1924, V. C. Dunlap 323 (U. S. Nat. Herb. No. 1,319,718, type).

Noteworthy among the Central American species because of the dimorphous leaves.

Cissus cardiophylla Standl., sp. nov.—Frutex scandens cirrhosus, ramis crassis, teretibus vel obtuse tetragonis, glabris, atrobrunneis, sparse et minute elevato-lenticellatis, internodiis 3-6.5 cm. longis; folia longipetiolata, petiolis gracilibus, 4.5-9 cm. longis, glabris, limbo ovato-cordato, 12-19 cm. longo, 7-12 cm. lato, breviter acuminato, basi profunde cordato vel rarius (in foliis ramorum florigerorum) rotundato vel truncato, integro, basi 5-nervio, crasso, glabro, nervis supra paullo elevatis, costa subtus elevata, crassa, nervis lateralibus (basalibus neglectis) utroque latere 7-8, adscendentibus, leviter arcuatis, prope marginem conjunctis; cymae oppositifoliae, 16 mm. longe pedunculatae, pauciramosae, pauciflorae, c. 7 cm. latae, ramulis glabratibus, pedicellis statu fructifero 4-6 mm. longis, incrassatis; baccae sessiles, obovoideae, 10 mm. longae, 8. mm latae, apice rotundatae, basi obtusae, glabrae.—Costa Rica: Along the railroad at Boca Banana, Atlantic coast, February, 1895, A. Tonduz 9154 (Herb. Field Mus. No. 577,647, type.)

Belonging to the group of *C. sicyoides* L., and related to *C. biformifolia*. Differing from the latter in the relatively narrower, acuminate, deeply cordate leaves.

TILIACEAE

Dicraspidia Standl., gen. nov.—Arbores parvae, pube stellata, ramulis alternis; folia alterna, membranacea, palmatinervia, dentata, subtus incano-tomentosa, supra viridia; stipulae geminae, difformes, intra-axillares, una filiformi, altera magna, foliacea, peltata; flores magni, flavi, supra-axillares, solitarii, longipedicellati; calycis tubus ovario adnatus, limbo 5-partito, lobis triangulari-oblongis, persistentibus, appendicibus filiformibus utroque latere 4-5 instructis, apice filiformi-productis; petala 5, obovata, apice inaequaliter dentata, glabra, perigyna; stamina indefinita, filamentis filiformibus, glabris, antheris oblongis, versatilibus, linearis-oblongis, apice biporo-

sis; ovarium 5-loculare, inferum, apice abrupte contractum, stylo brevi, stigmate crasso, sulcato-lobato, ovulis numerosissimis placentis protrusis affixis; fructus baccatus, bacca depresso-globosa, epicarpio tenui; semina numerosissima, minuta, obovoidea.

Type species, *Dicraspidia Donnell-Smithii* Standl.

Dicraspidia Donnell-Smithii Standl., sp. nov.—Arbor 3-4-metralis, ramulis teretibus, incano-tomentosis, viscido-villosulis et pilis rigidulis patentibus hirsutis, internodiis plerumque 2 cm. longis, stipulis occultis; stipulae difformes, intra petiolum insertae, una filiformi, 1 cm. longa, altera suborbiculari, 2-4.5 cm. longa, apice obtusa, basi subtruncata, dentata, peltatum 5-15 mm. supra basin affixa, sessili, supra stellato-pilosula, subtus incano-tomentosa; folia disticha, petiolis 10-14 mm. longis, stellato-tomentosis et pilosis; limbus oblongus vel lanceolato-oblongus, rarius supra medium paulo latior, 10-18 cm. longus, 3-7 cm. latus, abrupte acuminatus, acumine acuto, basi oblique breviterque cordatus vel rarius rotundatus, membranaceus, inaequaliter et dense serrato-dentatus, dentibus obtusis vel brevibus et rotundatis, supra viridis, stellato-pilosus vel glabratius, nervis non elevatis, subtus densissime incano-tomentosus et sparse pilosus, basi 5-7-nervius, costa utroque latere nervos 4-5 adscendentibus percurrentes ermittente, nervis omnibus gracilibus, elevatis, nervulis conspicuis, reticulatis; pedicelli 2.5-4.5 cm. longi, supra axillam, saepe in medio internodii, inserti, tomentosi, glanduloso-villosi et hirsuti; hypanthium 8 mm. latum, semiglobosum, dense tomentosum et hirsutum; calycis lobi 10-12 mm. longi, basi 5-6 mm. lati, attenuato-acuminati, extus dense tomentosi et hirsuti, appendice terminali filiformi, c. 1 cm. longa, pilosa, appendicibus lateralibus filiformibus, 7-8 mm. longis; petala 2-2.5 cm. longa, venosa, patentia; antherae 1.2-1.5 mm. longae; ovarium in tota parte libera dense tomentosum, stylo 3-4 mm. longo, basi incrassato, tomentoso, stigmate 2.5 mm. longo; bacca 1.5 cm. lata, 1 cm. longa, dense stellato-tomentosa et hirsuta; semina 0.4 mm. longa, fulva.—Panama: Banks of Changuinola River, Province of Bocas del Toro, February 19, 1924, V. C. Dunlap 439 (Herb. Field Mus. No. 579,988, type). Lower Changuinola River, 1923, H. E. Stork 286 (U. S. Nat. Herb.).—Costa Rica: Llanuras del Río Corredor, Golfo Dulce, February, 1897, H. Pittier 11,172 (U. S.). Boca Culebra on bank of Río Savegre, Pacific Coast, alt. 50 m., January, 1898, Pittier 12,156 (U. S.).

According to Pittier's notes, the plant is a shrub or small tree with spreading branches and smooth bark. The tree is conspicuous because of its large, bright yellow flowers about 4 cm. broad.

The tree here described is a very curious and interesting one, and the excellent specimens have remained so long—over 30 years—in the herbarium without a name only because it is difficult to determine the proper family to which it should be referred. Captain

John Donnell Smith made a detailed study of the specimens and prepared a partial description many years ago. He recognized the fact that a new generic type was represented. Material sent to Kew elicited from Oliver the opinion that the plant belonged to the Melastomaceae, doubtless because the anthers are dehiscent by apical pores, and because the ovary is inferior.

There is no doubt in the writer's mind, however, that the plant is closely related to the genus *Muntingia*, and that it should be referred, consequently, to the Elaeocarpaceae, or rather to the Tiliaceae, if these two families are to be combined. In general aspect, and in pubescence, leaf form, and gross appearance of the flowers *Muntingia* and *Dicraspidia* are very similar, so much so that their relationship can scarcely be questioned.

Dicraspidia differs essentially from other Tiliaceae in the inferior ovary. This is, of course, an important character. If the plant is not placed in the Tiliaceae, the only alternative is to treat it as the type of a new family. In view of its similarity in all respects to some Tiliaceae, this treatment does not seem advisable, and the plant is best regarded as an aberrant member of the Tiliaceae.

The most striking character of this Central American tree is found in the stipules. The larger leaflike peltate sessile stipules lie flat against the branches and almost wholly conceal them. I know of no other plant with stipules even remotely resembling those of *Dicraspidia*. The long filiform appendages of the calyx lobes also are noteworthy.

Sloanea anisophylla Standl., sp. nov.—Arbor 12-15 m. alta, trunco 45 cm. diam., ramulis gracilibus, teretibus, griseis vel ochraceis, laevibus, minute tomentellis vel glabratris, internodiis 1.5-5.5 cm. longis; folia disticha, petiolis 8-12 mm. longis, teretibus, tomentellis; limbus oblongo-ovatus vel oblongo-ellipticus, 10-14.5 cm. longus, 4.5-7 cm. latus, subabrupte breviterque acuminatus, acumine obtuso, basi valde inaequalis, obtusus vel rotundatus, integer, crasse membranaceus, pallide viridis, supra glaber, nervis vix elevatis, subtus ad nervos inconspicue tomentellus, costa tenui, elevata, basi trinervatus, nervis lateralibus utroque latere c. 5, arcuatis, prope marginem conjunctis; flores numerosi, cymoso-paniculati, paniculis terminalibus, 7-11 cm. longis, ramulis minute et dense stellato-tomentellis, pedicellis crassis, 5-13 mm. longis; alabastra globosa; sepala 5, lanceolato-oblonga, 7-9 mm. longa, versus apicem obtusum attenuata, extus dense stellato-tomentosa, intus glabra; petala lineari-lanceolata, sepalis breviora, glabra; stamina numerosa, congesta, glabra, calyce duplo breviora, filamentis aequantibus vel brevioribus,

antheris lanceolatis, acutis vel acuminatis; ovarium dense tomentellum, superne angustatum; stylus 3 mm. longus, simplex; capsula globosa, 5-locularis, 4 cm. longa, dense tomentella, rugulosa, basi et apice late rotundata, valvis crassis, lignosis; semina in quoque loculo 2-3.—Panama: Region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 352 (Herb. Field Mus. No. 579,723, type).

A tree with spreading drooping full crown and low buttresses. Flowers creamy white. Fruits pendent.

Among the Central American species of *Sloanea*, *S. anisophylla* is easily recognized by its terminal inflorescence, that of the other species being lateral.

Sloanea longicuspis Standl., sp. nov.—Arbor parva 3-4.5 m. alta, trunco 2.5-5 cm. diam., ramulis teretibus, gracilibus, ochraceis, versus apicem dense foliatis; petioli 8-12 mm. longi, supra sulcati, glabri; limbus oblongo-ellipticus, 17-22 cm. longus, 6-8.5 cm. latus, apice abrupte cuspidato-acuminatus, acumine angusto, longe attenuato, apice fere filiformi, 3 cm. longo, integer vel remote et obscure adpresso-serrulatus, infra apicem interdum grosse serratus, basi acutus vel obtusiusculus, pergamantaceus, glaber, supra viridis, costa et nervis lateralibus prominentibus, gracillimus, subtus paullo pallidior, nervis lateralibus utroque latere 8-9, angulo obtuso divergentibus, leviter arcuatis, prope marginem laxe conjunctis; pedicelli axillares, solitarii, c. 1 cm. longi; capsula globosa, 1.7 cm. diam., dense et longe echinata, spinis filiformibus, sparse hirtellis.—Panama: Progreso, Province of Chiriquí, 1927, G. P. Cooper and G. M. Slater 234; Yale No. 10,587 (Herb. Field Mus. No. 573,106, type). Duplicate in U. S. Nat. Herb., No. 1,318,439.

The species is marked by the narrow, long-cuspidate leaves, and small, densely echinate fruits

MALVACEAE

Abutilon jaliscanum Standl., sp. nov.—Arbor 4-5-metralis, ramulis gracilibus, teretibus, viridibus, stellato-tomentulosis, internodiis elongatis; petioli 3-10 cm. longi, teretes, minute stellato-tomentulosi, basi paullo dilatati; limbus late ovato-cordatus, 11.5-22 cm. longus, 7.5-15 cm. latus, subabrupte longiacuminatus, acumine attenuato, basi profunde cordatus, sinu lato, aperto, in toto margine crebre et brevissime undulato-dentatus, membranaceus, supra laete viridis, subsparse et minute stellato-pubescentes, subtus paullo pallidior, dense et velutine stellato-pubescentes, basi palmatin 9-nervius, nervis elevatis, gracilibus, costa nervos c. 5 adscendentibus utroque latere emittente; flores axillares, solitarii, pedicellis 4.5-6.5 cm. longis, adscendentibus, stellato-tomentellis, prope apicem articulatis; calyx profunde lobatus, 1.5-2 cm. longus, extus dense stellato-pubescentes, intus inferne glaber, superne stellato-pubescentes, lobis ovatis, 7-8

mm. latis, acutis vel acuminatis; petala patentia, pallide lutea, rotundato-spathulata, fere 3 cm. longa, c. 2.2 cm. lata, apice late rotundata, inferne abrupte contracta, venosa, extus sparse et minute pilosula, intus glabra; stamina petala subaequantia, columna 1.8 cm. longa, crassa, glabra, staminibus numerosissimis, filamentis 4-5 mm. longis, antheris subglobosis, fere 1 mm. diam.; carpella 12, 2 cm. longa, apice late rotundata, dense stellato-pubescentia.—Mexico: Streamside in dense woods, Hacienda de Otatal, Arroyo de los Palos Blancos, west of San Sebastián, Sierra Madre Occidental, Jalisco, alt. 1,500 m., March 8, 1927, *Ynes Mexia* 1842a (Herb. Field Mus. No. 579,917, type).

In the key to the Mexican species of *Abutilon* published by the writer (Contr. U. S. Nat. Herb. 23: 748. 1923), this plant runs at once to *A. Purpusii* Standl., a species of Veracruz and Chiapas. In that the calyx lobes are oval-ovate and merely mucronate, and the carpels are 2.5-3 cm. long.

Hibiscus anisaster Standl., sp. nov.—Herba erecta 2-3 m. alta, simplex, caulis teretibus, validis, dense et minute stellato-tomentosis et pilis longioribus intermixtis stellato-hispidulis, internodiis 1.5-3 cm. longis; petioli validi, 7-25 mm. longi, stellato-hispiduli et tomentelli, basi dilatati; limbus ovato-deltoides, 4.5-9 cm. longus, 4-7.5 cm. longus, 4-7.5 cm. latus, acutus, basi cordatus, dentatus, dentibus crebris, late triangularibus, acutiusculis, crassus, supra viridis, utrinque pilis inaequalibus dense stellato-pubescentia, subtus paullo pallidior, palmatim 7-nervius; flores racemosi, racemis 11 cm. longis, terminalibus, remote paucifloris, inferne foliatis, pedicellis 1.5-2.5 cm. longis, validis, superne paullo incrassatis, dense et minute stellato-tomentellis; bracteolae 8, inferne alte (4-6 mm.) inter se connatae, 12-15 mm. longae, oblongo-lineares, 2-3 mm. latae, acutae, stellato-tomentellae et sparse stellato-hispidulae; calyx 16 mm. longus, late campanulatus, extus dense stellato-tomentellus et sparse stellato-hispidulus, intus dense albido-tomentellus, ad medium 5-lobatus, lobis late ovato-oblongis, acutis; petala erecta, convoluto-conniventia, calycom aequantia, apice subtruncata, extus villosula; capsula juvenilis glabra.—Mexico: Openings in woods, lower slopes of the cordilleras, trail from Tepic to Santiago, Nayarit, alt. 1,000 m., September 15, 1926, *Ynes Mexia* 634 (U. S. Nat. Herb. No. 1,316,906, type).

An erect simple herb with dark red flowers.

The plant is not closely related to any of the species of *Hibiscus* reported from Mexico.

Pavonia amplifolia Standl., sp. nov.—Arbor parva, ramulis teretibus, viridibus, sparse pilis stellatis sessilibus hispidis; petioli 29-31 cm. longi, sparse pilis stellatis minutis et ceteris multo majoribus adpersis, teretibus, gracilibus; limbus ambitu rotundato-corda-

tus, c. 27 cm. longus et latus, acutus, basi profunde cordatus, sinu c. 6 cm. longo, aperto, breviter 7-lobatus, lobis triangularibus vel latissime triangularibus, acutis vel obtusis, breviter dentatus vel superne serratus, dentibus latissmis, obtusis, supra viridis, punctulis albidis conspersus, ad nervos sparse et minute pilulis stellatis adpressis puberulus, subtus puncticulatus et sparse pilis inaequalibus albidis stellatis conspersus, foliis supremis conformibus sed multo minoribus et breviter petiolatis; flores racemosi, racemis 11-20 cm. longis, prope basin foliis parvis bracteatis, multifloris, superne densis, bracteis superioribus lanceolato-linearibus, deciduis, calyce brevioribus, rhachi et pedicellis dense stellato-hispidulis, pedicellis validis, rigidis, adscendentibus, 1-2 cm. longis; bracteolae 10, basi inter se et cum tubo calycis connatae, lineares, acutae, 8-12 mm. longae, 1-1.5 mm. latae, sparse stellato-puberulae vel glabratae; calyx campanulatus, 8 mm. longus, fere ad medium lobatus, extus sparse stellato-hispidulus et puberulus, intus dense albido-tomentosus, lobis late ovatis, acutiusculis; petala lutea, 1.5 cm. longa, 1 cm. lata, late rotundato-spathulata, apice late rotundata, erecta, convoluta, extus villosula, intus glabra, inferne abrupte unguiculata; stamina longe exserta, columna 2 cm. longa, glabra, antheris late oblongis, 1.5 mm. longis, connectivo incrassato, pollinis granulis magnis, globosis, echinulatis; ovarium depresso-globosum, strigillosum.—Mexico: On stream bank, San Sebastián, Arroyo de las Castillas, Sierra Madre Occidental, Jalisco, alt. 1,500 m., January 14, 1927, *Ynes Mexia* 1480 (Herb. Field Mus. No. 579,816, type).

A small tree with canary-yellow flowers.

The species is a very distinct one, characterized by the remarkably large, broad leaves, and the long dense flower spikes.

Pavonia chiapensis Standl., comb. nov. *Malache chiapensis* Standl. Contr. U. S. Nat. Herb. 23: 772. 1923.

Pavonia nepetaefolia Standl., comb. nov. *Malache nepetaefolia* Standl. Contr. U. S. Nat. Herb. 23: 772. 1923.

Pavonia Ortegiana Standl., comb. nov. *Malache Ortegiana* Standl. Proc. Biol. Soc. Washington 37: 46. 1924.

Pavonia fulva Standl., comb. nov. *Malache fulva* Standl. Contr. U. S. Nat. Herb. 18: 115. 1916.

Pavonia Maxonii Standl., comb. nov. *Malache Maxonii* Standl. Contr. U. S. Nat. Herb. 18: 116. 1916.

Pavonia penduliflora Standl., comb. nov. *Malache penduliflora* Standl. Contr. U. S. Nat. Herb. 18: 117. 1916.

BOMBACACEAE

Quararibea parvifolia Standl., sp. nov.—Arbor parva, ramulis teretibus, gracilibus, fusco-brunneis, novellis stellato-puberulis, internodiis brevibus; stipulae lineares, 3-4 mm. longae, stellato-puberulae, deciduae; petioli 3-4 mm. longi, minute stellato-puberuli; limbus oblongus vel obovato-oblongus, 5-8 cm. longus, 2-3 cm. latus, apice abrupte breviterque acuminatus, acumine obtuso, basin versus paullo angustatus, basi ipsa rotundata, membranaceus, integer, supra laete viridis, lucidus, ad nervos minute puberulus, nervis et nervulis prominulis, subtus paullo pallidior, glabratus, costa gracili, elevata, nervis lateralibus utroque latere c. 8, adscendentibus, arcuatatis, prope marginem laxe conjunctis, nervulis prominulo-reticulatis; flores axillares, solitarii, pedicellis 6-8 mm. longis, bracteolis linearibus; calyx oblongus, 14 mm. longus, 4 mm. latus, basi acutus, minute stellato-lepidotus, intus adpresse villosus, breviter lobatus, lobis 2 mm. longis, rotundatis; columna staminea 5 cm. longa (vel longior?). —Costa Rica: La Palma, Sixaola, March 1, 1924, V. C. Dunlap 472 (Herb. Field Mus. No. 580,017, type).

Among the Central American species of *Quararibea* this is easily recognized by the small leaves and short calyx.

Matisia obliquifolia Standl., sp. nov.—Arbor 12-15 m. alta, trunco 20-25 cm. diam., ramulis crassis, rimosis, novellis stellato-tomentosis, folia alterna, petiolo gracili, 4.5-5.5 cm. longo, subtereti, stellato-pubescente; limbus oblique oblongus vel rhombico-bovatus, 17-22 cm. longus, 8-11 cm. latus, apice obtusus vel subrotundatus, basi valde inaequalis, uno latere acutus vel anguste rotundatus, altero profunde cordatus, lobo late rotundato, 2.5-4 cm. infra insertionem petioli producto, subcoriaceus, margine undulata, supra secus nervos stellato-puberulus, nervis vix elevatis, subtus secus nervos et nervulos stellato-puberulus, basi 3-nervius, lobo basali majore 4-nervio, costa gracili, elevata, utrinque nervos c. 6 graciles elevatos angulo acuto adscendentibus paullo curvatos emittente, nervis lateralibus nervulis transversis parallelis fere rectis connexis, nervulis ultimis arcte reticulatis; flores secus truncum fasciculati, fasciculis multifloris, pedicellis gracilibus, 1.5-2 cm. longis, sparse et minute stellato-puberulis; calyx campanulatus, 6-8 mm. longus, basi rotundatus, extus sparse et minute stellato-puberulus, intus dense sericeus, breviter 3-5-lobatus, lobis rotundatis, 2-2.5 mm. longis, calyce fructifero aucto, 1.5-2 cm. lato, patente; ovarium dense stellato-puberulum, loculis 1-ovulatis; fructus carnosus, ovoideus, 2-2.5 cm. longus, versus apicem contractus, obtusus et minute stellato-puberulus.—Panama: Daytonia Farm, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 435 (Herb. Field Mus. No. 579,345, type).

A tree with long clear bole and no buttresses. Flowers and fruits in clusters from pads along the main bole.

DILLENIACEAE

Doliocarpus nicaraguensis Standl., sp. nov.—Ramuli robusti, angulosi, recti, brunnei, rimosi, strigilosi vel glabri, internodiis 1.3-2.2 cm. longis; petioli recti, crassi, 1.3-2 cm. longi, 2-2.5 mm. lati, fere ad basin anguste marginati, subtus sparse strigilosi; limbus ellipticus vel late ellipticus, 8-9.5 cm. longus, 5-7 cm. latus, apice rotundatus et breviter obtuso-productus, basi obtusus vel rotundatus et abrupte decurrens, undulatus, coriaceus, supra griseo-viridis, lucidus, scaberulus, ad nervos minute hispidulus, costa et nervis prominulis, nervulis prominulis, arcte reticulatis, subtus opacus, asperulus, costa crassa, elevata, nervis lateralibus utroque latere c. 8, elevatis, angulo acuto adscendentibus, leviter arcuatis, prope marginem laxe conjunctis, nervulis vix prominulis, dense reticulatis; flores paniculati, paniculis axillaribus, sessilibus, laxe paucifloris, 1.5-2.5 cm. longis, axibus subrigidis, puberulis, bracteis lanceolato-oblongis, pedicellis gracilibus, 4-6 mm. longis, puberulis; sepala 3 mm. longa, rotundato-spathulata, apice rotundata, cava, persistens, reflexa; stamina indefinita, sepalis breviora; fructus didymus, 6-7 mm. latus, 4 mm. altus, loculis subglobosis, alte connatis, laevibus, glabris, lucidis; styli 1.5 mm. longi.—Nicaragua: Region of Bragman's Bluff, 1928, F. C. Englesing 277 (Herb. Field Mus. No. 579,852, type).

Doliocarpus nicaraguensis belongs to the section *Pinzona*, which has not been known heretofore from Central America. That section consists of only two species. The Nicaraguan plant is related to *D. coriaceus* (Mart. & Zucc.) Gilg, of Brazil, but the latter has glabrous leaves (according to description), and larger flowers on shorter pedicels.

Sauraia Englesingii Standl., sp. nov.—Ramuli validi, densissime pilis rigidis valde inaequalibus patentibus basi incrassatis ad 4 mm. longis hispidi, internodiis 5-8 mm. longis; petioli crassi, 2-2.5 cm. longi, supra anguste sulcati, dense hispidi; limbus elliptico-obovatus vel oblongo-ellipticus, 19-23 cm. longus, 8.5-10.5 cm. latus, acutus, versus basin paullo angustatus, basi ipsa anguste rotundata, crasse membranaceus, subinteger, supra viridis, asper, pilis brevibus patentibus hispidulus, ad nervos pilis longioribus hispidus, nervis conspicuis, non elevatis, subtus pallidior, dense pilis pallidis gracilibus hirsutus, ad nervos pilis longioribus basi incrassatis hispidus, costa crassa, elevata, nervis lateralibus utroque latere c. 21, adscendentibus, parallelis, fere rectis, versus marginem leviter arcuatis, juxta marginem conjunctis; flores cymoso-paniculati, paniculis axillaribus, dense multifloris, 4.5-7 cm. longis, 5.5-8.5 cm. latis, pedunculo 7.5-10.5 cm. longo, axibus densissime hispidulis, pedicellis crassis, ad 4 mm. longis, furfuraceo-hispidulis; sepala ovali-ovata, 4 mm. longa, obtusa, ciliolata, extus pilis crassis puberulis dense furfuraceo-hispida, marginibus tenuibus; petala 5 mm. longa, apice late rotundata,

glabra.—Nicaragua: Region of Bragman's Bluff, 1928, *F. C. Engle-*
sing 281 (Herb. Field Mus. No. 579,851, type).

The species is characterized by the copious pubescence of chiefly simple hairs, and by small flowers.

THEACEAE

Ternstroemia Pringlei (Rose) Standl., comb. nov. *Taonabo*
Pringlei Rose, Contr. U. S. Nat. Herb. 8: 322. 1905.

CLUSIACEAE

Tovomitopsis multiflora Standl., sp. nov.—Arbor glabra 9-11 m. alta, trunco 15-30 cm. diam., ramulis gracilibus, subteretibus, viridescentibus, internodiis 1-3.5 cm. longis; petiol. graciles, 1.2-2 cm. longi, supra anguste canaliculati; limbus obovatus vel oblanceo-lato-oblongus, 9-14 cm. longus, 3.5-6 cm. latus, abrupte acuminatus, acumine acuto vel obtusiusculo, basi acutus vel abrupte angustatus et breviter decurrentes, membranaceus, supra viridis, nervis inconspicuis, subitus paullo pallidior, costa gracili, prominente, nervis lateralibus utroque latere c. 12, angulo obtuso divergentibus, gracilis, arcuatis; paniculae terminales, multiramosae, pedunculatae, pedunculo c. 1.5 cm. longo, laxae, multiflorae, pedicellis gracilibus, 2.7 mm. longis; alabastra ovalia, 2.5 mm. longa, apice rotundata; bracteae calycinæ vix 1 mm. longae, apice obtusæ.—Panama: Progreso, Province of Chiriquí, 1927, *G. P. Cooper and G. M. Slater* 171; Yale No. 10,524 (Herb. Field Mus. No. 573,086, type), 274 (Yale No. 10,627).

A tree with straight clear bole 6 m. high. The wood is dark brown to red or blood when fresh, finishing deep pink when dry. It is heavy, hard, and dense, with irregular grain, and warps slightly in drying. The tree sometimes has aerial roots. Vernacular names, "coloradito" and "mangle colorado."

The specimens are only in bud, and the dissection of the buds has not been sufficiently satisfactory to make absolutely certain the generic position of the tree. From the other Central American species of *Tovomitopsis*, and especially from *T. nicaraguensis* (Oerst.) Triana & Planch., it differs in the very numerous and small, slender-pediced flowers.

Clusia Cooperi Standl., sp. nov.—Arbor epiphytica glabra-ramulis crassis, compressis, internodiis 1-4 cm. longis; petioli crassi, 1-2.2 cm. longi, basi incrassati; limbus obovatus vel obovato-ovalis, 12-16 cm. longus, 6-8 cm. latus, apice rotundatus vel obtusissimus, basi oblique acutus, subcoriaceus, concolor, costa subtus elevata, crassa, nervis lateralibus utroque latere c. 40, creberrimis, tenuis,

simis, 2-3 mm. distantibus, angulo lato divergentibus, prominulis, juxta marginem in nervum distinctum collectivum conjunctis; inflorescentiae masculinae terminales, breves, 4 cm. longae, pauciflorae, cymis plerumque trifloris, floribus breviter pedicellatis, pedicellis crassis; alabastra 2 cm. lata, depresso-globosa; bracteae calycinae 6, semiorbicularia, apice rotundatae, 7-9 mm. latae, dense obtuso-tuberculatae; sepala 4, bracteis similia, 1 cm. lata, obtuse carinata; petala 4, crassissime coriacea, decussata, exterioribus angulato-rotundatis, 17 cm. latis, 13 mm. longis, basi late rotundatis, apice late rotundatis vel brevissime emarginatis, extus rugulosis, interioribus minoribus, c. 1 cm. latis, cucullatis; torus quadratus, 10 mm. longus, 8 mm. latus; stamina numerosissima, 250-300, libera, antheris sessilibus, erectis, oblongis, apice submarginatis.—Panama: Bocas Island, near Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 460 (Herb. Field Mus. No. 579,412, type).

Local name given as "poison dogwood." A strangling epiphytic tree. Bark reported poisonous, and used to stupefy fish. A creamy sticky sap runs from the twigs when they are broken.

The species is well marked among the Central American representatives of the genus by the thin many-nerved leaves, very thick, leathery petals, rectangular torus, and very numerous stamens.

Clusia stenophylla Standl., sp. nov.—Arbor glabra 7.5 m. alta, trunco 10 cm. diam., ramulis crassis, obtuse angulatis, interdum compressis, internodiis 1-2 cm. longis; petoli crassi, 6-12 mm. longi, marginati; limbus anguste oblanceolato-oblongus vel obovato-oblongus, 12.5-21.5 cm. longus, 4.5-8 cm. latus, apice late rotundatus, versus basin cuneato-acutam sensim angustatus, coriaceus, supra viridis, costa vix elevata, subtus paullo pallidior, costa crassa, nervis lateralibus utroque latere c. 32, crebris, tenuissimis, inconspicuis, angulo acuto adscendentibus; inflorescentiae terminales, pauciflorae, 2.5-4 cm. longe pedunculatae, pedunculis ancipiiti-compressis, crassis, cymis trifloris, 1-2 cm. longe pedunculatis, floribus sessilibus; bracteae calycinae 2, basi colalitae, rotundatae, adpressae; sepala 4, decussata, tenuia, exterioribus late ovatis vel rotundatis, 8 mm. longis et latis, apice rotundatis, interioribus 10-11 mm. longis, 5-7 mm. latis, ovalibus, apice rotundatis; petala 4, subaequalia, oblongo-ovalia, c. 12 mm. longa et 7 mm. lata, apice rotundata, tenuia; torus 2.5 mm. longe stipitatus, 2 mm. crassus; stamina c. 100, antheris oblongis, 1.5 mm. longis, apice rotundatis, filamentis liberis, antheris subaequalibus, crassis, glabris.—Panama: Bocas Island, near Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 468 (Herb. Field Mus. No. 579,404, type).

Flowers fragrant, the petals white. Sap yellow and sticky.

Related, perhaps, to *C. minor* L., but in that the flowers are larger, the petioles longer, and the lateral nerves of the leaves much less numerous.

VIOLACEAE

Amphirrhox longifolia Spreng.—This genus of the Violaceae has not been recorded previously from North America. Specimens collected by Cooper (No. 605; Yale No. 12,238) at Buena Vista Camp on Chiriquí Trail, Panama, at 375 m., belong to the genus, and, apparently, are to be referred to the South American *A. longifolia*. The specimens were taken from a tree of 11 m., with a trunk diameter of 12.5 cm. The flowers are creamy white and faintly fragrant.

QUIINACEAE

Quiina panamensis Standl., sp. nov.—Arbor 15-metralis, trunco 25-30 cm. diam., ramulis gracilibus, teretibus, ochraceis, sparse puberulis vel glabratis, internodiis 1.5-3 cm. longis; folia opposita vel quaterna, petiolis tenuibus, c. 1 cm. longis, glabratis, fere ad basin marginatis, basi ipsa incrassata; limbus oblongo-ellipticus, 8-13 cm. longus, 3.5-5 cm. latus, apice abrupte cuspidato-acuminatus, acumine 1.2-2 cm. longo, integro, obtuso, basi abrupte cuneato-angustatus, longe decurrentis, crasse membranaceus, glaber, remote adpresso-crenatus, supra glaucescens, subtus pallide viridis, nervis utrinque prominentibus, lateralibus tenuibus, utroque latere c. 11, adscendentibus, arcuatis, percurrentibus; stipulae linearis-subulatae, 7-9 mm. longae, rigidæ, virides, puberulæ; racemi (non perfecte evoluti) terminales, pauciflori, rhachi adpresso-pilosula, bracteis inferioribus stipulis similibus, superioribus linearibus vel linearilanceolatis, alabastra aequantibus, adpresso-pilosulis; alabastra obovoidea, 2.5 mm. longa; flores brevipedicellati; sepalæ 4, exterioribus obovatis, apice rotundatis, extus minute puberulis.—Panama: Buena Vista Camp on Chiriquí Trail, alt. 375 m., 1928, G. P. Cooper 609; Yale No. 12,242 (Herb. Field Mus. No. 579,653, type).

Flowers white. Wood deep chocolate-brown when freshly cut.

The family Quiinaceae has not been reported previously from continental North America. The Panama species is related to *Q. jamaicensis* Griseb., in which the flowers are long-pedicellate, the sepals ciliate, and the stipules broader.

FLACOURTIACEAE

Carpotroche subintegra Standl., sp. nov.—Arbuscula vel frutex 3 m. altus, trunco 2.5 cm. diam., ramulis gracilibus, teretibus, ochraceis, minute strigillosis vel fere glabris, internodiis brevibus; petoli graciles, 1.2-2.5 cm. longi, apice incrassati; limbus anguste oblongus vel oblanceolato-oblongus, 16-23 cm. longus, 4-6.5 cm. latus, longe falcato-acuminatus, acumine 2-3 cm. longo, attenuato-acuto, basi obtusus, membranaceus, versus apicem remote serratus,

dentibus brevibus, apiculatis, adpressis, glaber, supra viridis, subtus paullo pallidior, costa tenui, elevata, nervis lateralibus utroque latere c. 9, tenuibus, adscendentibus, inaequalibus, fere rectis, remote a margine laxe conjunctis; pedunculi axillares, 1-2 mm. longi, 1-4-flori, pedicellis 1-2 mm. longis, minute adpresso-pilosulis, bracteis filiformibus, pedicellos vix superantibus; alabaster subglobosa, 4 mm. lata; sepala exteriora minute sericea.—Panama: Perrné, San Blas Coast, April 3-10, 1928, G. P. Cooper 638; Yale No. 12,271 (Herb. Field Mus. No. 579,244, type).

Evidently related to *C. glaucescens* Pittier, of Panama, in which the leaves are glaucescent and 10-13 cm. wide.

BEGONIACEAE

Begonia nicaraguensis Standl., sp. nov.—Herba acaulis; petioli graciles, 12-17 cm. longi, dense pilis longis brunnescentibus intertextis tenuibus villosi; limbus oblique rotundato-ovatus, 11-16 cm. longus, 7-11 cm. latus, apice acutus, basi oblique cordatus, breviter et remote lobatus, lobis late triangularibus, acutis vel acutiusculis, repando-denticulatis, tenuis, supra viridis, sparsissime pilis longis gracilibus pilosus, subtus praecipue ad nervos pilis longis brunneis tomentosus, basi 9-nervius; pedunculus c. 32 cm. longus, 4-5 mm. crassus, tenuiter brunneo-tomentosus; flores cymosi, cymis dichotomis, paucifloris, 9-11 cm. longis, bracteis rotundato-ovatis, 1.2-2 cm. longis, apice rotundatis, longipilosis, scariosis; pedicelli gracilimi, 5-8 mm. longi, sparse pilosi; sepala ovato-rotundata, 7-9 mm. longa, apice rotundata, basi late rotundata vel subcordata, glabra.—Nicaragua: On rocky cliffs and boulders in shade near Miranda Bodega, at the confluence of Tunky and Murciélagos creeks, region of Bragman's Bluff, alt. 25 m., February 23, 1928, F. C. Englesing 149A (Herb. Field Mus. No. 579,726, type), 149B.

“Flor de piedra.” Flowers said to be pinkish white. Reported as common in this region on rocky hills and mountains above the level of the coastal plain.

Begonia Mexiae Standl., sp. nov.—Herba perennis e rhizoma crassa acaulis; petioli carnosí, crassi, 15-20 cm. longi, 3-4 mm. crassi, squamis magnis brunneis scariosis laciniatis vel partitis onusti; limbus oblique rotundato-ovatus, c. 19 cm. longus et 13 cm. latus, acutus, basi profunde cordatus, sinu aperto, angusto, 2.5 cm. longo, lobis basalibus late rotundatis, interdum brevissime uno latere unilobatus, margine remote et obscure denticulato vel integro, basi 9-nervius, tenuis, supra viridis, subtus paullo pallidior, utrinque glaber, breviter villoso-ciliatus; cymae laxe multiflorae, bisexuales, floribus fertilibus paucis, 12-18 cm. longae, dichotomae, longipedunculatae, pedunculo 15-23 cm. longo, fere glabro, pedicellis gracilimis, 4-10 mm. longis, glabris; bracteae caducae, bracteolis late

ovatis, oppositis, infra medium pedicelli insertis, acuminatis, scar-
iosis, sepalala vix attingentibus; flos masculus: sepalala ovato-rotundata,
5 mm. longa, 5-6 mm. lata, obtusa, basi late rotundata, rosea, glabra,
venosa; stamina numerosa, filamentis brevibus, liberis; capsula 9
mm. longa, 3-angulata, angulis 2 anguste alatis, tertio in alam albam
acutiusculam tenuem venosam protracto.—Mexico: San Sebastián,
Hacienda del Otatal, Arroyo de los Tapeistes, Sierra Madre Occi-
dental, Jalisco, alt. 1,425 m., March 3, 1927, *Ynes Mexia* 1792
(Herb. Field Mus No. 579,895, type).

Begonia Mexiae resembles in general appearance *B. manicata* Cels, but differs from that species in its smaller flowers and scaly
indument.

Begonia ornithocarpa Standl., sp. nov.—Herba perennis e radice
tuberosa, caule erecto, simplici, c. 14 cm. alto, dense pilis longis
gracilibus patentibus villoso, internodiis elongatis; folia pauca, longi-
petiolata, inaequalia, superioribus minoribus, petiolo 0.8-5.5 cm.
longo, villoso; limbus late et peroblique ovatus, 4.5-10 cm. longus,
3-8 cm. latus, acutus vel acuminatus, basi breviter cordatus, sinu
aperto, breviter 7-9-lobatus, lobis late triangularibus, acutis vel
obtusis, inaequaliter dentatis, dentibus acutis, subulato-apiculatis,
basi 7-9-nervius, supra viridis, pilis gracilibus patentibus villosus,
subtus paulo pallidior, pilis longioribus densius villosus; cymae
femineae laxe 4-florae (statu fructifero), axillares, longipedunculatae,
pedunculo 10.5-13 cm. longo, sparse villoso, dichotomae, ramulis
primariis 2.5 cm. longis, pedicellis gracillimus, 3-4.5 cm. longis,
sparse pilosis; capsula 10-12 mm. longa, trigona, sparse villosa,
angulis 2 anguste alatis, tertio in alam horizontalem tenuem venosam
protracto, ala acuta, 1.5-2 cm. longa, margine inferiore serulato,
ciliato.—Mexico: Steep shaded ravine, near stream, Cerro de San
Juan, west of Tepic, Nayarit, September 19, 1926, *Ynes Mexia*
691 (Herb. Field Mus. No. 579,902, type).

LYTHRACEAE

Cuphea salvadorensis Standl., comb. nov. *Parsonsia salvadore-
nensis* Standl. Journ. Washington Acad. Sci. 14: 240. 1924.

LECYTHIDACEAE

Couroupita parviflora Standl., sp. nov.—Arbor alta, ramulis
crassis, dense foliatis; petioli crassi, c. 1.5 cm. longi, glabri; limbus
cuneato-obovatus, 14-19 cm. longus, 6.5-9 cm. latus, apice late
rotundatus, versus basin acutam sensim cuneato-attenuatus, integer,
subcoriaceus, supra obscure viridis, subtus pallidior, in axillis
nervorum lateralium breviter barbatus, costa crassissima, nervis
lateralibus utroque latere c. 17, adscendentibus, fere rectis, crassis,
elevatis, prope marginem conjunctis; racemi paniculati, 5-20 cm.

longi, axibus 5-6 mm. crassis, brunneis, rugulosis, sparse lenticellatis, tenuiter tomentulosis, multifloris, pedicellis crassis, 2-4 mm. longis; calyx 1.5 cm. latus, extus minute puberulus, tubo late turbinato, 5 mm. longo, obtuse 6-angulato; sepala 6, late ovata, apice rotundata, 5 mm. longa, intus sparse et minute puberula; petala crassa, inaequalia, rotundata, sessilia, glabra, concava, c. 1.5 cm. longa et lata; discus staminifer in ligulam cucullatam petaloideam 1.5 cm. longam productus; antherae oblongo-ovatae, 1 mm. longae, apice obtusae, loculis basi paullo separatis, filamentis 1.5-2 mm. longis, versus basin incrassatis, glabris; ovarium glabrum, stylo brevi, conico, stigmate parvo, 6-costato.—Panama: Changuinola Valley, 1927, G. P. Cooper and G. M. Slater 11 (U. S. Nat. Herb. No. 1,316,760, type).

Related to *C. odoratissima* Seem., of Panama. In that species the pedicels are 13-19 mm. long, the leaves oblong and acuminate, and the flowers much larger.

Couratari panamensis Standl, sp. nov.—Arbor magna 30-metralis, trunco 90-120 cm. diam, ramulis crassis, apice dense foliatis, adpresso-pilosulis; petioli 8-10 mm. longi, involuti, sparse hirtelli; limbus ovalis vel rotundato-ovalis, 5-10.5 cm. longus, 4-6.5 cm. latus, apice late rotundatus vel late et obtuse apiculatus, basi rotundatus, subcoriaceus, obscure et crasse sinuato-crenatus, supra viridis, lucidus, ad costam hirtellus, nervulis prominulis, subtus ad costam sparse et breviter fasciculato-hirtellus, costa crassa, nervis lateralibus utroque latere c. 14, angulo lato adscendentibus, tenuibus, prominentibus, fere rectis, prope marginem conjunctis, nervulis prominulis, laxe reticulatis; pyxis lignea, scyphiformis, cylindrica, obscure trigona, 11.5-15 cm. longa, 5 cm. lata, laevis, basi obtusa et contracta, versus orificio paullo angustata, margine calycari 7-14 mm. ab orificio distante, zona supracalycari inde paullo extrorsum flexa; operculum non visum—Panama: Cricamola Valley, region of Almirante, 1928, G. P. Cooper 542 (Herb Field Mus. No. 579,346, type).

The material at hand consists of the tip of a branch, bearing four leaves, and of three slightly weathered, empty fruits. The fruits are much like those of *C. macrocarpa* Mart., as illustrated in the Flora Brasiliensis.

The genus *Couratari* is new for the Central American flora

Gustavia rhodantha Standl, sp. nov.—Arbor parva 4.5 m. alta, trunco 5 cm. diam, ramulis teretibus, glabratibus, ad apicem dense foliatis; petioli graciles, 1-6.5 cm. longi, supra plani, glabri; limbus anguste oblongus vel lanceolato-oblongus, 12-23 cm. longus, 4-7 cm. latus, apice perfecto non viso, basi acutus vel abrupte attenuatus et decurrentis, remote et obscure adpresso-crenulatus, crasse membranaceus, glaber, nervis in pagina superiore vix elevatis, subtus

paullo pallidior, nervis elevatis, tenuibus, lateralibus utroque latere c. 12, adscendentibus, fere rectis, prope marginem conjunctis, nervulis prominulis, reticulatis; flores pauci (c. 3), ad apicem rami fasciculati, pedunculis 7-10 mm. longis, ut pedicellis minutissime puberulis, pedicellis 1-2 cm. longis, crassis, bracteolis connatis, 4 mm. longis, parte libera deltoidea, acuta; calyx c. 1.5 cm. latus, extus minute puberulus, tubo tereti, late turbinato, limbo fere integro, ciliolato, intus glabro; petala 8, subaequalia, rosea, anguste oblonga, c. 6.5 cm. longa et 2 cm. lata, apice rotundata, extus minute puberula; stamina numerosissima, ad marginem disci inserta, disco 1.5 cm. alto, glabro, filamentis tenuibus, c. 2 cm. longis, glabris, antheris oblongis, acutiusculis, 2.5 mm. longis, loculis parallelis, poris apicalibus, obliquis; ovarium apice puberulum, 1 cm. latum, stylo brevi, conico.—Panama: Permé, San Blas Coast, April 3-10, 1928, G. P. Cooper 633; Yale No. 12,266 (Herb. Field Mus. No. 579,238, type).

This species is remarkable for its large showy flowers. Among the Central American species¹ it is related most closely to *G. nana* Pittier¹, whose flowers are not known. The leaves of *G. nana* are much larger than those of *G. rhodantha*, and their nerves more numerous.

Gustavia integrifolia Standl., sp. nov.—Arbor; folia sessilia, oblongo-oblanceolata, 70 cm. longa, 18 cm. lata, apice abrupte acuminata, acumine 2.5 cm. longo, angusto, attenuato-acuminato, basin versus longe attenuata, integra vel obsolete undulata, subcoriacea, glabra, supra viridia, nervis elevatis, subtus paullo pallidiora, costa crassa, prominente, ochracea, sulcata, nervis lateralibus utroque latere c. 40, angulo lato divergentibus, rectis, versus apicem abrupte curvatis, juxta marginem conjunctis, nervulis transversis subparallelis, prominulis; flores 3 cm. lati, breviter racemosi, racemis umbelliformibus, 3-9-floris, pedicellis c. 1 cm. longis, validis, glabris, bracteis late ovatis, 3 mm. longis, acuminatis, brunneis; hypanthium turbinatum, 5 mm. longum, apice 4 mm. latum, glabrum; calyx profunde lobatus, 5 mm. longus, lobis inaequalibus, apice late rotundatis vel truncatis, glabris; petala 4, obovato-oblonga, 1.5-2 cm. longa, 7-10 mm. lata, apice rotundata, crassa, glabra; androphorum 8 mm longum, 11 mm. latum, glabrum.—Nicaragua: Region of Bragman's Bluff, 1928, F. C. Englesing 225 (Herb. Field Mus. No. 579,727, type).

Related to *G. superba* (Kunth) Berg, a species common in Panama and Costa Rica, but in that the leaves are serrate, and the large flowers, 8-12 cm. broad, on pedicels 2-6 cm. long, have eight petals.

COMBRETACEAE

Bucida macrostachya Standl., sp. nov.—Ramuli teretes, grisei, rimosi, foliiferis insigniter incrassatis, 10-12 mm. crassis, densissime

¹See Pittier, Contr. U. S. Nat. Herb. 26: 3. 1927.

foliatis; folia alterna, ad apices ramulorum congesta, petiolo valido, 4-4.5 cm. longo, dense pilis fulvis subadpressis sericeo; limbus ellipticus vel obovato-ellipticus, 12-17.5 cm. longus, 5-9 cm. latus, apice obtusus vel rotundatus, apiculatus, versus basin obtusam paullo angustatus, integer, crasse membranaceus, supra glaber vel ad nervos sparse pilosulus, punctulis albidis crebris conspersus, costa impressa, subtus ad nervos pilis brevibus adpressis vel subpatentibus pilosulus, costa gracili, elevata, nervis lateralibus utroque latere c. 16, gracilibus, elevatis, angulo acuto adscendentibus, fere rectis, prope marginem laxe reticulato-conjunctis, nervulis reticulatis, prominulis; spicae numerosae, axillares, pedunculo 3-5 cm. longo, dense pilis brevibus patentibus brunnescentibus piloso, spica ipsa 4-9 cm. longa, densissime multiflora, 12-15 mm. crassa, floribus sessilibus; fructus immaturus oblique ovoideus, 5-6 mm. longus, obtuse angulatus, acutus, tomentosus; calyx persistens, turbinato-campanulatus, 3 mm. latus, 2 mm. altus, extus tomentosus, remote denticulatus; stamina exserta, filamentis gracilibus, glabris, antheris ovoideis, apiculatis; stylus exsertus, pilosus.—Guatemala: El Rancho, December 28, 1907, W. A. Kellerman 7744 (Herb. Field Mus. No. 224,629, type).

The only other species known from Central America, *B. buceras* L., differs in having small leaves with fewer curved lateral nerves, and short, less dense flower spikes.

RHIZOPHORACEAE

Cassipourea podantha Standl., sp. nov.—Arbor vel frutex 3-18 m. altus, trunco interdum 30-45 cm. diam., ramulis gracilibus, minute strigillosis vel glabratis, internodiis 1-4 cm. longis; petioli 6-8 mm. longi, strigilosi vel glabri, supra late canaliculati; limbus oblongo-ellipticus vel lanceolato-oblongus, 8.5-12.5 cm. longus, 3.5-4.5 cm. latus, abrupte longiacuminatus, acumine 1-2 cm. longo, recto vel falcato, plerumque acuto, basi sensim vel abrupte angustatus, acutus, breviter decurrens, membranaceus vel crasse membranaceus, statu juvenili sparse strigillosus, mox glaber, concolor, integer vel obsolete sinuato-serrato, costa subtus tenui, elevata, nervis lateralibus tenuibus, utroque latere 6-7, arcuatis vel fere rectis, remote a margine arcuato-conjunctis; pedicelli axillares, fasciculati, pauci, 2-3 mm. longi, strigilosi; calyx glaber, 3.5-4 mm. longus, basi in stipitem 1-1.2 mm. longum abrupte contractum, lobis 5, ovatis, acutis, intus sericeis, tubo paullo brevioribus, erectis; ovarium sericeum, stylo gracili, 4 mm. longo, dense sericeo, e calyce exerto.—Panama: Cricamola Valley, region of Almirante, 1928, G. P. Cooper 504 (Herb. Field Mus. No. 579,426, type). Bocas Island, Cooper 462. Buena Vista Camp on Chiriquí Trail, alt. 375 m., Cooper 608 (Yale No. 12,241).

Vernacular name, "goatwood." Wood very hard and durable, used for piles in dock. A tree with straight bole and no buttresses.

The notes with one of the specimens state that the corolla is orange and the anthers yellow, but neither is present on the specimens.

C. elliptica Poir., the only species reported heretofore from Central America, has a sessile, not stipitate, more or less sericeous calyx.

Cassipourea macrodonta Standl., sp. nov.—Arbor parva 7 m. alta, trunco 10 cm. diam., ramulis gracilibus, teretibus, ochraceis vel pallide brunneis, sparse strigillosis vel glabratris, internodiis 3-6 cm. longis; petioli 4-5 mm. longi, graciles, sparse strigilosi; limbus ovato-ellipticus, 9.5-11.5 cm. longus, 4-5.5 cm. latus, subabrupte longiacuminatus, basi acutus vel obtusus et saepe breviter contractus, margine fere ad basin grosse et remote serrato, dentibus 2-3 mm. longis, 8-15 mm. distantibus, obtusis vel acutiusculis, saepe salientibus, crasse membranaceus, supra glaber, subtus nitidulus, ad nervos sparse strigilosus vel fere omnino glaber, costa tenui, elevata, nervis lateralibus utroque latere 6-7, divaricato-adscendentibus, fere rectis, remote a margine arcuato-conjunctis; flores axillares, dense fasciculati, pedicellis crassis, 1-2 mm. longis, strigillosis; calyx extus sparsissime strigilosus, tubo 2.5 mm. longo, campanulato, basi rotundato, in stipitem 1-1.5 mm. longum protracto, lobis 5, triangulari-ovatis, 2 mm. longis, patentibus vel reflexis, acutis, intus dense cinereo-strigillosis; ovarium glabrum, apice depresso, stylo 6-7 mm. longo, dense strigoso.—Panama: Changuinola Valley, March 16, 1924, V. C. Dunlap 563 (Herb. Field Mus. No. 580,037, type), 447. Daytonia Farm, region of Almirante, Cooper 446, 447.—Costa Rica: La Palma, Sixaola Valley, Dunlap 469.

A small tree with spreading crown and slanting bole; flowers pale yellow. From both *C. elliptica* and *C. podantha* this differs in the coarsely serrate leaves, glabrous ovary, short pedicels, and numerous flowers.

MYRTACEAE

Eugenia cricamolensis Standl., sp. nov.—Arbor 11 m. alta, trunco 15 cm. diam., ramulis crassis, teretibus, vetustioribus ochraceis, novellis dense et minute sericeis, internodiis 1-3 cm. longis; petioli crassi, 3-5 mm. longi, minute sericei; limbus elliptico-oblongus, 7.5-8.5 cm. longus, 2.7-4 cm. latus, apice abrupte et breviter acuminatus, acumine obtuso, 1 cm. longo vel breviore, basi obtusus et interdum abrupte contractus, subcoriaceus, supra luteo-viridis, glaber, costa impressa, nervis lateralibus inconspicuis, subtus densissime pilis minutis sericeus, indumento nitente, brunnescens vel glauco, costa crassa, elevata, nervis lateralibus utroque latere c. 12, angulo lato divergentibus, leviter arcuatis, prope marginem in nervum collectivum conjunctis; flores ad nodos defoliatos fasciculati, numerosi, pedicellis 6-8 mm. longis, minute sericeis; hypanthium obovoidum, 2 mm. longum, sericeum; sepala ovalia, 2-2.5 mm. longa,

apice rotundata, glanduloso-punctata, extus minute sericea; filamenta glabra; ovarium ad apicem puberulum.—Panama: Kankintoe, 10 miles above Holstein, Cricamola Valley, 1928, G. P. Cooper 511 (Herb. Field Mus. No. 579,631, type).

Local name, "white cacique." A tree, the bole excentric at base, with low buttresses or swellings. Fruit (not seen by the writer) 2.5 cm. in diameter, with 1 or 2 large seeds.

Eugenia pleurocarpa Standl., sp. nov.—Frutex vel arbor parva 2-5 m. alta, ramulis gracilibus, subteretibus, cinnamomeis, novellis brunneo-sericeis, cito glabratris, internodiis plerumque 1.3-4 cm. longis; petioli 5-8 mm. longi, graciles vel crassiusculi, brunneo-sericei vel glabratii, supra sulcati; limbus oblongo-ovatus vel elliptico-oblongus, 3.5-10 cm. longus, 2-4.5 cm. latus, versus apicem obtusum angustatus, basi obtusus vel rotundatus, subcoriaceus, statu juvenili utrinque pilis brevibus cinereis et brunneis strigoso-sericeus, cito glabratius, supra viridis, nervis vix prominulis, subtus pallidior, minute puncticulatus, costa elevata, nervis lateralibus utroque latere 8-11, prominulis, angulo lato divergentibus, fere rectis, prope marginem conjunctis; flores solitarii vel breviter racemosi, racemis axillaribus, 3-5-floris, pedicellis fructiferis 4-8 mm. longis, glabratris; bacca ellipsoideo-oblonga, c. 2 cm. longa et 1 cm. crassa, apice obtuso calyce persistente coronata, basi contracta, 10-costata, costis gracilibus, saepe glaucescens, glabra, puncticulata; calycis lobi rotundati, 2.5 mm. longi, extus sparse adpresso-pilosuli vel glabratii, apice rotundati, puncticulati; semen 1, oblongum, 15 mm. longum, 8 mm. latum.—Mexico: Wooded mountain slope, Quimixto, Jalisco, alt. 70 m., November 29, 1926, *Ynes Mexia* 1176 (Herb. Field Mus. No. 579,920, type). San Sebastián, trail to El Ranchito, Jalisco, alt. 1,500 m., *Mexia* 1446 (U. S. Nat. Herb.). Hacienda del Otatal, Arroyo de los Palos Blancos, west of San Sebastián, alt. 1,500 m., *Mexia* 1843a (U. S. Nat. Herb.).

"Chapirole." Fruit said to be edible.

The species is noteworthy because of the long narrow costate fruit.

Eugenia Mexiae Standl., sp. nov.—Arbor parva 4-5-metralis, ramulis crassis, teretibus, rimosis, pallide brunneis, internodiis elongatis; petioli crassi, 5-7 mm. longi, adpresso-tomentelli; limbus oblongus vel oblanceolato-oblongus, 8.5-16 cm. longus, 3.5-6 cm. latus, apice rotundatus, versus basin obtusam paullo angustatus, coriaceus, supra glabratius, nervis vix elevatis, subtus pallidior, pilis albidis leviter adpresso-tomentellus, costa crassa, elevata, nervis lateralibus utroque latere 8-13, plerumque angulo lato divergentibus, fere rectis, prope marginem conjunctis; flores breviter racemosi, 3-5-floris, 3-4 cm. longis, pedicellis crassis, 3-8 mm. longis, cinereo-tomentellis; bacca ellipsoidea, 1.5 cm. longa, 1 cm. lata, basi et apice rotundata, cinereo-tomentella vel glabrata, calyce persistente

coronata; calycis lobi 2.5 mm. longi, rotundati, extus tomentelli; semen 1.—Mexico: Steep rocky wooded hillside rising abruptly above the ocean, south of Puerto Vallarta, Jalisco, alt. 100 m., November 25, 1926, *Ynes Mexia* 1129 (Herb. Field Mus. No. 579,921, type).

A relative of *E. avicenniae* Standl., of Guerrero, but that species differs in its smaller and narrower leaves and small fruits.

MELASTOMACEAE

Cryptophysa Standl. & Macbr., gen. nov.—Frutices setosi; folia opposita, membranacea, obsolete denticulata vel fere integra, petiolo superne vesiculifero, vesiculo secundum partem inferiorem costae extenso, angusto; flores parvi, pedicellati, cymoso-paniculati, paniculis terminalibus, laxe multifloris; calyx in albastro clausus, setulosus, limbo simplici, calyptraeformi, acuminato, basi circumscisso; petala 6, obovata, apice cuspidulata; stamina 12, aequala, filamentis, crassis, glabris, antheris oblongis, ractis, 1-porosis, connectivo basi non producto, inappendiculato; ovarium totum adhaerens, 6-loculare, stylo brevi, glabro, stigmate peltato; fructus non visus.

Type species, *Cryptophysa setosa* Standl. & Macbr.

Cryptophysa setosa Standl. & Macbr., sp. nov.—Ramuli graciles, 2-2.5 mm. crassi, tetragoni, minute furfuraceo-puberuli et dense pilis rigidis fulvescentibus patentibus 3-5 mm. longis setosi, internodiis elongatis; petioli graciles, parte nuda 1.5-5 cm. longa, dense setosi, supra vesciculiferi, vesiculo infra limbum 5-10 mm. longo, basi acuto, 5-6 mm. lato, viridi, setoso, superne in limbo securus costam c. 2.5 cm. extenso, superne sensim angustato; limbus late ellipticus, 11.5-21 cm. longus, 6.5-10.5 cm. latus, apice obtusus vel rotundatus et abrupte acuminatus, rarius acutus et longius acuminatus, acumine ad 1.5 cm. longo, basi anguste rotundatus, margine obsolete undulato-denticulato vel fere integro, tenuiter membranaceus, utrinque pilis gracillimis longis patentibus setosus, supra viridis, subtus pallidus, 7-plinervius, nervis gracillimis, nervulis transversis non conspicuis, angulo recto abeuntibus, remotis; paniculae solitariae vel geminatae, 3-5.5 cm. longae, laxae, pedunculo gracili, 2-4 cm. longo, ramulis sparse puberulis et dense setosis, pedicellis 1.5-4 mm. longis, setosis; alabastra 4-4.5 mm. longa, obovoideo-ovalia, setulosa, apice subulato-acuminata; calyx campanulatus, 2 mm. longus, truncatus; petala alba, 4.5-5 mm. longa, apice cuspidato-acuminata, glabra; filamenta petalis dimidio breviora, antheris flavis, fere 2 mm. longis.—Panama: Buena Vista Camp on Chiriquí Trail, 1928, G. P. Cooper 219 (Herb. Field Mus. No. 579,293, type).

The plant here described as the type of a new genus can not be referred satisfactorily to any of the recognized genera of the

Melastomaceae. Although the fruit has not been seen, there is every reason for presuming that it is baccate. Because of the circumscissile calyx, *Cryptophysa* evidently is related to *Conostegia*, but in that genus the leaves are never furnished with inflated vesicles, and the petals are rounded or emarginate at apex.

In *Cryptophysa* the vesicles are unusual in extending not only well down on the petiole but also far up the costa into the leaf blade as far as the point of origin of the uppermost pair of lateral nerves.

Prosanerpis panamensis Blake & Standl., sp. nov.—Frutex epiphyticus, repens, ramulis gracilibus, teretibus, minute ferrugineo-puberulis, in fere tota longitudine radiculos emittentibus, internodiis 3.5-5 cm. longis; folia paris maxime inaequalia, minoribus brevipetiolatis, petiolo gracili, 1.5-6 cm. longo, puberulo, limbo ovato vel late ovato, 9-17.5 cm. longo, 6-9 cm. lato, subabrupte acuminato, basi breviter cordato, inaequaliter dentato, ciliato, 7-nervio, supra laete viridi, minutissime scaberulo, subtus pallidiore, ad nervos ferrugineo-puberulo; cymae pauciflorae, e ramis defoliatis nascentes, pedicellis 3-4 mm. longis, puberulis; bacca subglobosa, 4 mm. diam., longe hirsuta; calycis lobi 4, persistentes, lanceolato-oblongi, acuti, paucidentati, longe ciliati.—Panama: Cerro de Garagará, Sambú Basin, southern Darién, alt. 500-975 m., February 7, 1912, H. Pittier 5611 (U. S. Nat. Herb. No. 715,883, type).

The genus *Prosanerpis* Blake¹ was based upon a single species, *P. trichocalyx*, from the Department of Copán, Honduras. The Honduran species differs from the present one in having hispid branches, and leaves which are rounded at base and spreading-pilose beneath.

Conostegia jaliscana Standl., sp. nov.—Frutex 1 m. altus, ramulis crassis, subteretibus vel obtuse tetragonis, brunnescens, novellis pilulis brunnescentibus stellatis dense furfuraceo-tomentellis, serius glabratiss; internodiis 1-3 cm. longis; petioli crassi, 5-12 mm. longi, dense et adpresso furfuraceo-tomentosi; limbus elliptico-oblongus, 7-14.5 cm. longus, 2.5-5 cm. latus, apice acutus et caudato-acuminatus, acumine c. 1 cm. longo, angusto, obtuso, basi obtusus vel acutiusculus, 5-plinervius, crasse membranaceus, serrulatus, dentibus aristulo subulato praefixis, supra viridis, primo pilis rigidis simplicibus sparse hispidus, cito glabratus, subtus vix pallidior, ad nervos furfuraceo-tomentosus, mox glabratus, nervis gracilibus, elevatis, nervulis transversis angulo fere recto abeuntibus, numerosis, parallelis, prominentibus; flores cymoso-paniculati, paniculis terminalibus, 4.5-6 cm. longis, paucifloris, pedunculo crasso, 1-3 cm longo, ramulis primariis 3-13 mm. longis, sparse furfuraceo-puberulis, cymulis plerumque trifloris, pedicellis crassis, 2.5 mm longis; alabastra oblongo-

¹Contr. U. S. Nat. Herb. 24: 15. 1922.

ovoidea, 10-13 mm. longa, apice acuminata, obtusa, glabra vel basin versus sparse furfuraceo-puberula, paullo infra medium circumscissa; calyx campanulatus, 5 mm. longus; petala 5, alba, 1 cm. longa, apice rotundata, glabra; stamina exserta, filamentis gracilibus, glabris, 2.5 mm. longis, antheris anguste oblongis, 3 mm. longis, apice subtruncatis; stylus 4.5 mm. longus, glaber.—Mexico: Along stream, Arroyo de los Hornos, Hacienda del Otatal, east of San Sebastián, Sierra Madre Occidental, Jalisco, alt. 1,500 m., March 5, 1927, *Ynes Mexia* 1819 (Herb. Field Mus. No. 579,918, type).

Among the Mexican species this is most closely related to *C. superba* Don. That species differs in its large broad leaves and smaller buds.

Conostegia hirtella Don.—This species was described from Guatemala, and is not reported from Mexico. There may be referred here, however, the following collection in the herbarium of Field Museum: Cerro Campana, Chiquihuitlán, Distrito de Cuicatlán, Oaxaca, alt. 850 m., Aug. 22, 1909, *Conzatti* 2504. There is referred here, also, with some doubt, *Ynes Mexia* 1532, from San Sebastián, Jalisco. The latter specimen is noteworthy for its large, conspicuously dentate leaves, but in pubescence and flower characters it agrees well enough with southern specimens of *C. hirtella*.

Conostegia micrantha Standl., sp. nov.—Arbor 4.5-7.5 m. alta, trunco 2.5-7.5 cm. diam., ramulis validis, obtuse quadrangulatis, vetustioribus ochraceis, novellis viridibus, pilis minutis stellatis tomentosis, internodiis 1.5-3 cm. longis; petioli 1-3 cm. longi, graciles, minute et non dense stellato-tomentelli; limbus elliptico-ovatus vel late ellipticus, 8-15 cm. longus, 4.5-8 cm. latus, apice obtusus vel acutus et caudato-acuminatus, acumine e basi angusta trianguli, oblongi-lineari, 6-10 mm. longo, obtuso, basi obtusus vel rotundatus, 5-plinervius, remote et obscure repando-denticulatus vel fere integer, margine saepe anguste revoluto, supra viridis, ad costam minuto stellato-puberulus vel fere omnino glaber, nervis subimpressis, subtus pallidior, minute stellato-pilosulus, nervis gracilibus, elevatis, nervulis transversis prominentibus, crebris, parallelis, angulo fere recto abeuntibus; flores cymoso-paniculati, paniculis terminalibus, 2.5-5.5 cm. longis, 2.5-6 cm. latis, dense multifloris, pedunculo crasso, 2-2.5 longo, ramulis stellato-tomentosis, pedicellis 1 mm. non superantibus; alabastra ovalia, 3-3.5 mm. longa, apice rotundata vel obtusa, sparse et minute stellato-puberula vel glabrata, circumscissa; calyx campanulatus, 2 mm. longus, truncatus; petala oblonga, 4 mm. longa, alba, basi purpurascens, apice rotundata, glabra; antherae flavae, oblongae, 1.8 mm. longae, apice truncatae, glabrae.—Panama: Buena Vista Camp on Chiriquí Trail, alt. 375 m., 1928, G. P. Cooper 578; Yale No. 12,211 (Herb. Field Mus. No. 579,667, type); at 540 m., Cooper 619.

Among the Central American Conostegias this is marked by the very small flowers.

Henriettella densiflora Standl., sp. nov.—Frutex vel arbor parva 3 m. alta, ramulis gracilibus, subteretibus, dense granuloso-furfuraceis, indumento pallide brunneo, internodiis 1-1.5 cm. longis; petioli crassi, 3-6 mm. longi, granuloso-furfuracei; limbus oblongo-ellipticus, 5-11 cm. longus, 2-4.5 cm. latus, abrupte acuminatus, acumine 7-15 mm. longo, recto vel subfalcato, obtuso, basi acutus vel obtusiusculus, trinervius, integer, membranaceus, supra viridis, glaber vel primo ad nervos granuloso-furfuraceus, subtus pallidior, ad nervos et nervulos dense granuloso-furfuraceus, nervis gracilibus, elevatis, nervulis transversis angulo lato divergentibus, crebris, rectis, parallelis; flores ad axillas fasciculati, sessiles, congesti, fasciculis paucifloris; calycis tubus oblongus, 2.5-3 mm. longus, obtuse costatus, dense granuloso-furfuraceus, limbo 4-lobato, lobis 1.2-1.8 mm. longis triangulari-oblongis, acutiusculis, intus papillosis.—Panama: Farm Eight pasture, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 575; Yale No. 12,208 (Herb. Field Mus. No. 579,692, type).

Henriettea brunnescens Standl., sp. nov.—Arbor 7.5 m. alta, trunco 10 cm. diam., ramulis 3-4 mm. crassis, obtuse tetragonis, dense pilis longis divaricatis brunneis setoso-pilosus, internodiis elongatis; petioli 2.2-5 cm. longi, validi, dense setoso-pilosus; limbus ellipticus vel ovato-ellipticus, 14.5-26 cm. longus, 8-14 cm. latus, acuminatus, acumine recto vel subfalcato, attenuato, basi obtusus, 5-plinervius, membranaceus, remote et minutissime repando-denticulatus, supra setosus, subtus dense pilis patentibus setuloso-pilosus, nervis gracilibus, elevatis, nervulis transversis angulo recto abeuntibus, numerosis, parallelis; flores ad nodos defoliatos ramorum vetustiorum fasciculati, fasciculis 2-4-floris, pedicellis validis, 14-17 mm. longis, dense pilosis; calycis tubus campanulatus, basi rotundatus, 7-10 mm. longus, 6-8 mm. latus, dense pilis brunnescensibus rectis vel curvatis setuloso-pilosus, limbo breviter 5-lobo, 4 mm. longo, lobis late rotundatis, apiculatis.—Panama: Buena Vista Camp on Chiriquí Trail, alt. 375 m., 1928, G. P. Cooper 594; Yale No. 12,227 (Herb. Field Mus. No. 579,610, type).

Chaetolepis nana Standl., sp. nov.—Herbacca vel suffruticosa, parce ramosa, caulinibus procumbentibus, ad 20 cm. longis, e nodis radices emittentibus, pilis longis albidis rigidulis adscendentibus setoso-pilosus, internodiis 1-2 cm. longis; petioli 4-5 mm. longi, adpresso setoso-pilosus; limbus ovatus vel late ovatus, 1-2 cm. longus, 7-12 mm. latus, obtusus vel acutiusculus, basi obtusus vel rotundatus, 7-plinervius, integer, adpresso setuloso-ciliatus, membranaceus, supra dense adpresso-pilosus et adpresso-setosus, subius dense adpresso-pilosus; flores pauci, ad apices ramulorum solitarii, pedicellis gracilibus, 7-8 mm. longis, adpresso-pilosus; calycis tubus

clavatus, 4 mm. longus, pilis subadpressis dense setuloso-pilosus, lobis 4, cum setis alternatis, ovato-oblongis, 2 mm. longis, acutis, in setam longam productis, setoso-ciliatis; petala 4, obovata, alba vel purpurea; stamina 8, subaequalia, filamentis gracilibus, antheris linearibus, 3 mm. longis, basi non productis, inappendiculatis; capsula clavata, 7 mm. longa, apice 4 mm. lata; semina numerosa, minuta, obovoidea, nigra.—Panama: On Chiriquí Trail, alt. 900 m., 1928, G. P. Cooper 233 (Herb. Field Mus. No. 579,265, type), 232.

ONAGRACEAE

Fuchsia decidua Standl., sp. nov.—Frutex, in anthesi aphyllus, ramis elongatis, subteretibus vel obtuse tetragonis, 3-9 mm. crassis, rimosis, vetustioribus griseis, junioribus brunneis, glabris, internodiis 1-2 cm. longis; flores racemoso-paniculati, paniculis laxe paucifloris, fere sessilibus, 4-6 cm. longis, glabris, ramiculis gracilibus, glaucis, pedicellis gracilibus, 3-5 mm. longis; ovarium oblongum, 4 mm. longum, glaucescens; calycis tubus 3.5 cm. longus, basi 1.8 mm. latus, superne sensim dilatatus, ore 5 mm. latus, glaucescens, lobis oblongis, obtusis, 10-12 mm. longis, 4 mm. latis; petala subrotundata, 2 mm. longa et lata; stamina inaequalia, filamentis crassiusculis, 5-7 mm. longis, antheris late obovoideis, 1.5-1.8 mm. longis.—Mexico: In crevices of rocks on steep south slope, Real Alto, La Bufa, Sierra Madre Occidental, Jalisco, alt. 2,500 m., Jan. 30, 1927, Ynes Mexia 1601 (Herb. Field Mus. No. 579,815, type).

Flowers light vermillion.

Among the Mexican species of *Fuchsia*, this plant is related only to *F. fulgens* DC., which has expanded leaves at the time of flowering, a sparsely pilose calyx, and acuminate calyx lobes.

MYRSINACEAE

Ardisia rarescens Standl., sp. nov.—Ramuli teretes, crassi, sparse ferrugineo-tomentelli vel glabri, ad apicem dense foliati, internodiis brevibus; petioli crassi, 10-12 mm. longi, glabri, supra canaliculati; limbus oblanceolato-oblongus, 11-12.5 cm. longus, 4 cm. latus, apice breviter acuminate, acumine obtuso, basi cuneato-acutus, integer, margine subrevoluto, chartaceus, glaber, supra obscurae viridis, in siccitate nigrescens, costa impressa, subtus brunnescens, punctulis crebris elevatis conspersus, costa tenui, elevata, nervis lateralibus utroque latere c. 19, angulo lato divergentibus, arcuatis, juxta marginem inaequilateri conjunctis, nervulis inconspicuis; paniculae subpyramidales, 13 cm. longae, 16 cm. latae, 3-4-pinnatae, laxe multiflorae, ramiculis divaricatis, gracilibus, minute puberulis vel glabratris, floribus subumbellatis, umbellis c. 5-floris, pedicellis 5-9 mm. longis, ferrugineo-puberulis, bracteis linearibus, 1.5-2 mm. longis, patentibus, obtusis, puberulis; sepala 5, oblongo-

ovata, 2 mm. longa, acutiuscula, dense punctulis rotundatis punctata, sparse et minute puberula, glanduloso-ciliata; alabastra 4 mm. longa, acuminata, petalis glabris, punctulatis.—Mexico: Cerro del Boquerón, Chiapas, September, 1913, C. A. Purpus 7032 (Herb. Field Mus. No. 415,794, type).

Purpus 7032, as represented in the herbarium of Field Museum, is a mixture, the flowering material belonging to the species here described. A fruiting branch mounted with the type is apparently *Parathesis reflexa* Brandeg.

Ardisia rarescens is related to *A. crenipetala* Mez, but in that species the leaves are crenate, and the inflorescence is shorter than the leaves.

Ardisia oblanceolata Standl., sp. nov.—Arbor 6 m. alta, trunco 7.5 cm. diam., ramulis crassis, brunnescentibus, glabratis, ad apicem dense foliatis, internodiis brevissimis; petioli 6-10 mm. longi, glabri, fere ad basin marginati; limbus anguste oblongo-oblanceolatus, 14-20 cm. longus, 3.5-5 cm. latus, versus apicem longe acuminatum, rarius acutum vel obtusiusculum, sensim angustatus, acumine obtuso, versus basin longe sensimque attenuatus, decurrentis, membranaceus, integer, glaber, supra viridis, costa elevata, nervis obscuris, subtus pallidior, punctulis subfuscis satis conspicuis crebris conspersus, costa tenui, nervis lateralibus tenuissimis, utroque latere c. 14, angulo lato divergentibus, rectis vel leviter arcuatis, prope marginem arcuato-conjunctis; inflorescentia bipinnata, pauciflora, c. 4 cm. longa, floribus umbellatis, umbellis paucifloris, glabris, pedicellis gracilibus, curvatis, 6-8 mm. longis; sepala 5, lanceolato-linearia, versus apicem acutiusculum sensim attenuata, 3 mm. longa, basi vix 1 mm. lata, glanduloso-ciliolata; drupae globosae, rubrae, 1 cm. longae, glanduloso-punctatae; semen multicostatum.—Panama: Region of Almirante, 1928, G. P. Cooper 370 (Herb. Field Mus. No. 579,578, type).

Another specimen referable here is *Cooper 12* (Yale No. 10,474) from the Talamanca Valley, Costa Rica, collected in June, 1927.

Among the Central American Ardisias this is easily recognized by the long and very narrow leaves.

Ardisia amplifolia Standl., sp. nov.—Arbor parva vel frutex omnino glaber, ramulis crassis, subteretibus, ochraceis, internodiis 0.7-2 cm. longis; petioli 12-15 mm. longi, crassi, supra canaliculati, anguste alati, ad margines nigro-punctati; limbus oblongo-obovatus, 22-27 cm. longus, 8.5-11 cm. latus, apice obtusus, basin versus longe cuneato-attenuatus et decurrentis, integer, crasse membranaceus, supra viridis, punctulis paullo elevatis dense punctulatus, costa impressa, nervis conspicuis, prominulis, subtus pallidior, costa valida, elevata, nervis lateralibus utroque latere c. 23, angulo lato divergentibus, fere rectis, prope marginem laxe reticulato-conjunctis,

margine anguste revoluto; inflorescentia terminalis, bipinnatim paniculata, 6 cm. longa, 4 cm. lata, brevipedunculata, floribus ad apices ramulorum primiorum umbellatis, umbellis 2-7-floris, superioribus ad apicem axis centralis sessilibus, pedicellis 6-11 mm. longis, gracilibus; bracteae caducae, herbaceae, lanceolatae, 1-1.5 cm. longae, acutae, nigro-punctulatae; sepala dextrorum tegentia, late ovalia, 2.5 mm. longa, apice rotundata, dense punctata, marginibus epunctatis, pallidis; alabastra 8 mm. longa, attenuata; petala lanceolato-linearia, attenuata, breviter connata, 1.7 mm. lata, dense lineis et punctis rubro-brunneis conspersa; filamenta 1 mm. longa, antheris linearibus, 5-5.5 mm. longis, superne attenuatis.—Nicaragua: Region of Bragman's Bluff, 1928, F. C. Englesing 230 (Herb. Field Mus. No. 579,731, type).

Related to *A. paschalis* Donn. Smith, of Guatemala and Honduras, which differs in having broad corolla lobes, rounded at apex, and ciliolate sepals.

Ardisia sanmartensis (Rusby) Standl., comb. nov. *Icacorea sanmartensis* Rusby, Descr. N. Sp. S. Amer. Pl. 8o. 1920.

Ardisia Herbert-Smithii (Rusby) Standl., comb. nov. *Icacorea Herbert-Smithii* Rusby, Descr. N. Sp. S. Amer. Pl. 8o. 1920.

Ardisia Rusbyana Standl., nom. nov. *Icacorea granatensis* Rusby, Descr. N. Sp. S. Amer. Pl. 79. 1920, not *Ardisia granatensis* Mez, 1902.

Parathesis obovata Standl., sp. nov.—Ramuli graciles, subteretes, brunnescentes, sparse lenticellati, novellis adpresse brunneo-tomentulosis; petioli graciles, 5-12 mm. longi, glabri; limbus oblongo-obovatus, 4-7 cm. longus, 2-3 cm. latus, apice obtusus vel rotundatus, basin versus sensim angustatus, basi ipsa acuta, crasse membranaceus, integer, supra viridis, lucidus, glaber, costa impressa, nervis obscuris, subtus paullo pallidior, ad nervos sparse puberulus vel glabratius, costa gracili, elevata, nervis lateralibus utroque latere c. 15, gracillimus, obscuris, angulo lato divergentibus; inflorescentia tripinnatim paniculata, laxe multiflora, pyramidalis, 13-18 cm. longa, c. 11 cm. lata, inferne foliata, ramulis gracilibus, patentibus, ferrugineo-tomentellis, pedicellis gracilibus, 5-9 mm. longis, tomentellis; bracteae lineares vel vel anguste spatulatae, 2-5 mm. longae, punctatae, plerumque in petiolulum contractae; sepala ovata, acuta, 1.3 mm. longa, sparse et minute tomentella; alabastra 4-5 mm. longa, ovoidea, obtusa, tomentella, petalis dense tomentellis.—British Honduras: Tower Hill, 1928, J. S. Karling (Herb. Field Mus. No. 579,927, type).

This species is noteworthy because of the small, obovate, nearly glabrous leaves with obtuse or rounded apex.

SAPOTACEAE

Lucuma pentasperma Standl., sp. nov.—Arbor 11-metralis, truncо 25 cm. diam., ramulis gracilibus, obtuse angulatis, ochraceis, glabris, minute lenticellatis, internodiis elongatis; petioli 13-20 mm. longi, graciles, supra canaliculati, primo sparse sericei, mox glabri; limbus obovato-oblongus vel elliptico-oblongus, 12.5-26 cm. longus, 4-10 cm. latus, abrupte breviterque acuminatus, acumine 1.5-2 cm. longo, obtuso, basi acutus, glaber, lucidus, laete viridis, costa tenui, supra plana vel leviter impressa, subtus elevata, nervis lateralibus utroque latere c. 12, angulo lato adscendentibus, arcuatis, prope marginem laxe conjunctis, nervulis intermediis prominulis, laxe reticulatis; fructus subglobosus, subsessilis, 5 cm. diam., glaber; semina 5, suborbicularia, compressa, laevia, nitida, brunnea, 25 mm. longa, 12 mm. lata, 7 mm. crassa, margine dorsali acuto.—Panama: Region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 369 (Herb. Field Mus. No. 579,577, type).

“Wild sapote.” A tree with milky sap. Fruit edible, the rind golden brown, the pulp juicy.

Lucuma lucentifolia Standl., sp. nov.—Arbor 7.5 m. alta, truncо 25 cm. diam, ramulis vetustioribus teretibus, griseis, junioribus crassis, brunneo-sericeis vel glabratis, internodiis brevibus; petioli 1-2.5 cm. longi, graciles, supra late canaliculati, glabri; limbus obovatus vel cuneato-obovatus, 9-17 cm. longus, 4-7 cm. latus, apice abrupte breviacuminatus, acumine deltoideo, obtuso, crasse chartaceus, fere omnino glaber, utrinque lucidissimus, supra obscure viridis, nervis vix prominulis, subtus pallidior, costa elevata, nervis lateralibus utroque latere 10-11, tenuibus, prominentibus, angulo lato divergentibus, arcuatis, juxta marginem conjunctis, nervulis prominulis, laxe reticulatis; flores e ramis defoliatis nascentes, pedicellis crassis, 5 mm. longis; bacca globosa, c. 6 cm. diam., cortice dense albido-lenticellato; semina elliptico-oblonga, compressa, 3.2 cm. longa, 1.5 cm. lata, 7 mm. crassa, apice et basi obtusa, brunnea, laevia, nitida.—Costa Rica: Talamanca Valley, June, 1927, G. P. Cooper 13 (Herb. Field Mus. No. 572,705, type).

The specimens were taken from a tree with large crown, left by the Indians in clearing for its fruit. The tree is reported to reach a large size in the forest.

Lucuma chiricana Standl., sp. nov.—Arbor 30-metralis, truncо 60-75 cm. diam., ramulis gracilibus, angulatis, pallide brunneis, lenticellatis, glabris, internodiis brevibus vel elongatis; petioli 8-13 mm. longi, crassi, supra plani vel leviter sulcati, glabri; limbus oblongus, late oblongus vel oblanceolato-oblongus, 8.5-15.5 cm. longus, 2.5-6 cm. latus, abrupte breviterque acuminatus, acumine 8-10 mm. longo, obtuso, basi obtusus et saepe breviter contractus, coriaceus, lucidus, glaber, costa supra prominula, subtus elevata, tenui, nervis lateralibus utroque latere c. 12, angulo lato divergen-

tibus, tenuissimis, leviter arcuatis, juxta marginem laxe conjunctis, nervulis inconspicuis, arcte reticulatis; fructus globoso-obovoideus, 3.5 cm. longus, apice late rotundatus, edulis, laevis, sparse et minute sericeus; semen 1, subglobosum, 2 cm. longum, basi et apice late rotundatum, laeve, brunneum.—Panama: Progreso, Chiriquí, 1927, G. P. Cooper and G. M. Slater 254; Yale No. 10,607 (Herb. Field Mus. No. 573,174, type; duplicate in U. S. Nat. Herb.). Progreso, Cooper and Slater 230 (Yale No. 10,583).

“Níspero, Níspero colorado.” A large forest tree with high buttresses. The fruit and sap yield a copious sticky latex. The latex and wood are bitter. The wood is reddish, hard, heavy, hard to split, and durable. According to the collectors’ notes, the tree yields commercial balata.

Lucuma calistophylla Standl., sp. nov.—Arbor 18-metralis, trunco 45 cm. diam., ramulis crassis, subteretibus, sericeis vel glabratris, internodiis brevibus vel elongatis; petioli crassi, 2-3 cm. longi, supra plani vel leviter sulcati, minute sericei vel glabri; limbus obovato-ellipticus, 19-22 cm. longus, 8.5-9.5 cm. latus, apice rotundatus vel obtusus et breviter cuspidato-acuminatus, acumine 1-1.5 cm. longo, angusto, acuto, basi acutus vel attenuatus, crasse coriaceus, supra griseo-viridis, glaber, costa prominente, subtus minute et densissime brunneo-sericeus, costa crassa, elevata, nervis lateralibus utroque latere c. 21, validis, angulo lato divergentibus, elevatis, leviter curvatis, juxta marginem conjunctis, margine anguste revoluto; flores et fructus non visi.—Panama: Cricamola Valley, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 481 (Herb. Field Mus. No. 579,416, type).

“Mameicillo.” A tree with stout branches and no buttresses. Sap milky.

Because of the absence of flowers and fruit, the generic position of this tree is, of course, uncertain. It seems desirable to give it a name, because it is clearly distinct in foliage characters from all the Sapotaceae hitherto reported from Central America. The tree is well marked by the broad coriaceous leaves, densely brown-sericeous beneath.

Lucuma euryphylla Standl., sp. nov.—Arbor 15-metralis, trunco 15 cm. diam., ramulis validis, obtuse angulatis, sparse sericeis, internodiis elongatis; petioli validi, 3-4 cm. longi, supra late canalicolati vel fere plani, sparse sericei vel glabri; limbus ellipticus, obovato-ellipticus vel obovato-oblongus, 16-20 cm. longus, 5.5-10 cm. latus, abrupte acuminatus, acumine angusto, 1-1.5 cm. longo, acuto, basi acutus, crasse membranaceus, supra obscure viridis, glaber, nervis conspicuis, subtus pallidior, dense nitido-sericeus, costa crassa, elevata, nervis lateralibus utroque latere 9-10, angulo

acuto adscendentibus, elevatis, tenuibus, fere rectis, versus apicem curvatis, juxta marginem conjunctis, nervulis prominulis, reticulatis; flores axillares, fasciculati, pauci, pedicellis crassis, rectis, 4-5 mm. longis, dense sericeis; scapula imbricata, exterioribus ovalibus, 3.5 mm. longis, apice rotundatis, extus dense et minute sericeis, interioribus 4 mm. longis, late ovalibus, ad costam sericeis; corolla ochroleuca, tubo 2.7 mm. longo, glabro, lobis 5, late oblongis, 2 mm. longis, apice subtruncatis, ciliolatis; stamina inclusa, filamentis gracilibus, glabris, antheris oblongo-ovatis, filamentis duplo brevioribus; ovarium dense hirsutum, stylo glabro, crasso, stamina aequante.—Panama. Buena Vista Camp on Chiriquí Trail, alt. 375 m., 1928, G. P. Cooper 611; Yale No. 12,244 (Herb. Field Mus. No. 579,635, type).

A tree with long slender clear bole 7.5 m., high, and narrow buttresses, the twigs hollow. Sap slightly milky. Bark very thin, somewhat stringy below.

Among the Central American species of *Lucuma* this is well marked by the broad sericeous leaves.

APOCYNACEAE

Stemmadenia macrantha Standl., sp. nov.—Arbor 7.5 m. alta, laticifera, omnino glabra, trunco 7.5 cm. diam., ramulis gracilibus, c. 2 mm. crassis, subteretibus vel angulatis, rimosis, ochraceis, internodiis 0.5-2 cm. longis; folia opposita, petiolis crassulis, 2-5 mm. longis, supra sulcatis, limbo oblanceolato-oblongo, 6.5-14 cm. longo, 1.8-3.5 cm. lato, longe et abrupte caudato-acuminato, acumine recto vel falcato, angusto, acuto, 1-1.5 cm. longo, versus basin acutam angustato, membranaceo, supra viridi, costa sulcata, nervis lateralibus conspicuis sed non elevatis, subtus paullo pallidiore, costa gracili, elevata, nervis lateralibus utroque latere c. 12, angulo lato vel acuto adscendentibus, curvatis, prope marginem conjunctis; flores ad apices ramulorum pauci vel breviter racemosi, pedicellis 5-7 mm. longis, validis; calyx 5-partitus, viridis, segmentis paullo inaequalibus, 2-3 cm. longis, lanceolata-oblongis, obtusis, viridibus, venulosis, intus basi verticillo glandulorum numerosorum filiformium onustis; corolla hypocrateriformis, flava, tubo 7 cm. longo, basi 4 mm. lato, superne paullo dilatato, fauce 1 cm. lato, intus glabro, lobis late oblongis, 2-3 cm. longis, apice rotundatis; stamina 2.5 cm. supra basin tubi inserta, antheris linearis-sagittatis, 4.5 mm. longis; discus annularis, 1 mm. altus.—Panama. Kankintoe, 10 miles above Holstein, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 510 (Herb. Field Mus. No. 579,383, type).

“Mountain jasmin.” A copious milky sap exudes from the bark when it is cut.

The species is well marked by the large corolla with narrow tube, which is only slightly broadened upward.

Plumeria microcalyx Standl., sp. nov.—Arbor 9-metralis, omnino glabra, trunco 15 cm. diam., ramulis 4-5 mm. crassis, cavis, internodiis brevibus; folia opposita vel subopposita, petiolo crasso, 1-1.5 cm. longo, supra late sulcato, limbo obovato-elliptico vel oblongo-obovato, 10-16 cm. longo, 5-7.5 cm. lato, apice obtuso vel subrotundo, basi acuto vel acutiusculo, subcoriaceo, supra viridi, lucido, nervis conspicuis, nervulis paullo elevatis, reticulatis, subtus pallidiorae, costa valida, elevata, nervis lateralibus utroque latere 11-15, gracilibus, elevatis, angulo lato divergentibus, fere rectis, versus apices abrupte curvatis, prope marginem laxe conjunctis, margine anguste revoluto; flores cymoso-paniculati, paniculis multifloris, densis, c. 12 cm. longis et latis, pedunculatis, pedunculo crasso, compresso-angulato, 7-8 cm. longo, ramulis compressis, pedicellis crassis, 2.5-8 mm. longis; bracteae ovatae, c. 2 cm. longae et 1 cm. latae, apice acutae et subulato-cuspidatae; calyx eglandulosus, 5-partitus, lobis maxime inaequalibus, remotis, anguste triangularibus vel linear-lanceolatis, 1-3 mm. longis, deciduis; corolla alba, hypocrateriformis, tubo gracili, 2 cm. longo, basi 1.7 mm. lato, intus basi infra insertionem antherarum breviter villosulo, lobis 5, linear-oblengis, obtusis, 2 cm. longis; stamina prope basin tubi inserta, antheris oblongis, inappendiculatis, 2.5 mm. longis, apiculatis.—Panama: Permé, San Blas Coast, April 3-10, 1928, G. P. Cooper 642; Yale No. 12,275 (Herb. Field Mus. No. 579,227, type).

“Wild jasmine.” A tree with divided bole. Flowers fragrant.

From all the other Central American species of *Plumeria* this is distinguished at once by the small flowers, with very small calyx, and by the few nerves of the leaves.

Rauwolfia macrocarpa Standl., sp. nov.—Arbor 4.5-6 m. alta, trunco 7.5 diam., ramulis gracilibus, teretibus, puberulis, lenticellis sparsis albidis vix elevatis conspersis, internodiis 4-9.5 cm. longis; folia ternata vel quaternata, inaequalia, petiolis 1-4 mm. longis, supra canaliculatis, puberulis; limbus oblongo-ellipticus vel foliorum minorum late ellipticus, 4.5-11.5 cm. longus, 2.2-5 cm. latus, acutus vel breviter acuminatus, basi obtusus, membranaceus, supra obscure viridis, nitidulus, glaber, minute puncticulatus, subtus minute et dense velutino-pilosulus, costa valida, elevata, nervis lateralibus utroque latere c. 12, gracillimis, prominulis, angulo lato adscendentibus, leviter arcuatis; cymae axillares, laxe pauciflorae, pedunculo 1.6-4.5 cm. longo, puberulo, pedicellis crassis, 4-6 mm. longis; calyx 2-2.5 mm. longus, lobis ovalibus, apice rotundatis, puberulis, ciliolatis, erectis; fructus globosus, 1.5 cm. diam., sessilis, apice et basi late rotundatus, glaber.—Panama: Progreso, Chiriquí, 1927, G. P. Cooper and G. M. Slater 200; Yale No. 10.553 (Herb. Field Mus. No. 573,121, type).

“Fruta del diablo.” A small bushy tree with large crown. Fruit showy, greenish, becoming yellowish red at maturity. The fruit and sap yield a copious sticky latex.

From the few other Central American species of *Rauwolfia* this is distinguished by the very large fruits.

Rauwolfia purpurascens Standl., sp. nov.—Frutex scandens, omnino glaber, laticifer, ramulis validis, 2.5-4 mm. crassis, subteretibus vel obtuse angulatis, brunneis, internodiis 1-5 cm. longis; folia ternata, petiolo 8-25 mm. longo, valido, supra late sulcato, limbo obovato, oblongo-obovato vel elliptico-obovato, 7.5-16 cm. longo, 3-7 cm. lato, breviter et abrupte acuminato, acumine triangulari, acuto, basi acuto vel acuminato, crasse membranaceo, supra viride, nervis conspicuis sed vix elevatis, subtus paullo pallidiore, costa gracili, elevata, nervis lateralibus utroque latere 14-16, angulo lato divergentibus, arcuatis, juxta marginem conjunctis; flores cymosopaniculati, paniculis terminalibus, sessilibus, 6-8 cm. longis, laxe multifloris, e basi ramosis, ramulis primariis gracilibus, 2.5-4 cm. longis, apice umbellatim ramosis, cymulis umbelliformibus, paucifloris, pedicellis gracilibus, rectis, 2.5-6 mm. longis; calyx 1.8 mm. longus, eglandulosus, profunde 5-fidus, lobis oblongo-ovatis, obtusis, erectis; corolla purpurascens, hypocrateiformis tubo 7 mm. longo, 1.5 mm. crasso, intus infra et supra insertionem staminum villosulo, fauce paullo constricto, lobis 5, 5 mm. longis, ovato-oblongis, obtusis; stamina ad apicem tubi inserta, antheris ovatis, acutis, inappendiculatis, 0.6 mm. longis; discus cupularis, 0.5 mm. longus; stylus filiformis, 2.5 mm. longus, stigmate minuto.—Panama: Cricamola Valley, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 516 (Herb. Field Mus. No. 579,377, type).

A vine growing around an old sota-caballo tree. Milky sap in the new shoots and in pith, but rare in the bark.

All the other species of *Rauwolfia* known from Central America are erect shrubs.

ASCLEPIADACEAE

Vincetoxicum stenanthum Standl., sp. nov.—Volubilis, scandens, ramis gracilibus, teretibus, pallide brunnescens, ad nodos puberulis, internodiis elongatis; petioli graciles, 1-2 cm. longi, glabri; limbus oblongo-ovatus, 3.5-6 cm. longus, 1.5-3 cm. latus, acutus vel abrupte breviterque acuminatus, basi cordatus, sinu lato, aperto, 4-7 mm. longo, lobis basalibus rotundatis, membranaceus, glaber, supra viridis, subtus pallidior, basi 5-nervius, costa valida, elevata, nervis lateralibus utroque latere c. 5, angulo acuto adscendentibus; cymae axillares, solitariae, umbelliformes, 1-5-florae, 1-2.5 cm. longe pedunculatae, pedunculo glabro, pedicellis inaequalibus, gracillimus, 1-5 cm. longis, sparsissime et minute puberulis vel glabris; calycis lobi in anthesi reflexi, anguste lanceolati, 1.5 cm. longi, versus apicem sensim attenuati, glabri; corolla rotata, fere ad basin 5-fida, lobis linearibus, 1.5-2 cm. longis, basi 3 mm. latis, versus apicem sensim attenuatis, evenosis, prope basin minute papilloso, glabris, tantum basi coronae hirtellis; corona annularis, obscure lobata, humillima,

4 mm. lata; gynostegium humile, depresso.—British Honduras: Tower Hill, 1928, J. S. Karling 27 (Herb. Field Mus. No. 579,928, type).

The conspicuous characters of this plant are the long narrow glabrous corolla lobes and the long reflexed calyx lobes.

VERBENACEAE

Lippia ligustrina (Lag.) Britton, var. *Schulzii* Standl., var. nov.—*Folia elliptica, obovata vel oblongo-elliptica, 5-18 mm. longa, 3-7 mm. lata, apice obtusa, basi acuta vel obtusa, dentata vel integra, dentibus utroque latere 1-4, magnis, salientibus, obtusis, supra densissime tuberculata, scaberula, subtus dense strigillosa et praecipue ad nervos pilis rigidulis brevibus adscendentibus hispidula; ceteris formae typicae similis.*—Texas: Vicinity of Fort Davis, August 5, 1928, *Ellen D. Schulz* 2020 (Herb. Field Mus. No. 579,850, type).—Sonora: Valley of the Altar River, April 2, 1884, *C. G. Pringle*.

In the typical form of the species the leaves are usually somewhat narrower and entire, with much finer, closely appressed pubescence. The corolla is rather more copiously hispidulous in var. *Schulzii* than in the normal form.

Stachytarpheta luisana Standl., comb. nov. *Valerianoides luisanum* Standl. Contr. U. S. Nat. Herb. 23; 1242. 1924.

Verbena pumila Rydb. f. *albiflora* Standl., f. nov.—Corolla alba; ceteris formae typicae omnino similis.—Texas: San Antonio, spring of 1926, *Lydia E. Pagel* 2208 (Herb. Field Mus. No. 580,190, type).

Vitex Cooperi Standl., sp. nov.—Arbor 18-23 m. alta, trunco 60-75 cm. diam., ramulis teretibus vel compressis, ochraceis vel pallide brunneis, rimosis, novellis fulvo-puberulis, internodiis 1.5-3.5 cm. longis; petioli graciles, 2.5-6.5 cm. longi, supra canaliculati, minute puberuli; foliola 3, inaequalia, lateralibus minoribus et brevius petiolatis, petiolulo 2-7 mm. longo; foliorum limbus late ellipticus, 4.5-14 cm. longus, 2.5-7.5 cm. latus, apice rotundatus et breviter acuminatus vel interdum abrupte acuminatus, acumine obtuso et apiculato, basi acutus vel abrupte contractus, integer, membranaceus, supra viridis, nitidulus, minutissime puberulus vel glabratus, nervis impressis, subtus pallidior, puberulus vel glabratus, costa gracili, elevata, nervis lateralibus utroque latere c. 15, angulo lato divergentibus, leviter arcuatibus, prope marginem reticulato-conjunctis; cymae axillares, solitariae, laxe multiflorae, 3.5-6 cm. longae, pedunculo gracili, 5-6 cm. longo, ramulis puberulis, pedicellis 1-3 mm. longis; calyx late campanulatus, 1.5 mm. longus, remote denticulatus, puberulus, dentibus minutis, acutis; corolla 6-7 mm. longa, extus dense glanduloso-puberula, lobis intus minute puberulis; stylus

gracilis, *glaber*; *fructus obovoideus*, 10 mm. *longus*, 7 mm. *latus*, *apice late rotundatus vel subtruncatus, glaber*.—Panama: Progreso, Chiriquí, July-August, 1927, G. P. Cooper and G. M. Slater 156; Yale No. 10,509 (Herb. Field Mus. No. 573,061, type), 195 (Yale No. 10,548), 241 (Yale No. 10,594).

“Cuajada.” A large tree, buttressed and fluted. Frequent. Wood durable, used for ties and stringers.

Closely related to *V. floridula* Duchass. & Walp., also of Panama, but in that species the leaves usually are not developed at the time of flowering, the cymes are only half as large and short-peduncled, and the corolla is much larger.

***Citharexylum hirtellum* Standl., sp. nov.**—Ramuli *graciles*, vix 2 mm. *crassi*, *tetragonii et striati*, minute *puberuli*, *internodiis 2-6 cm. longis*; *petioli graciles*, 7-9 mm. *longi*, *supra anguste sulcati*, *puberuli*; *limbus anguste oblongo-ellipticus*, *anguste ellipticus vel rarius ovatus*, 6.5-9.5 cm. *longus*, 2.3-3.5 cm. *latus*, *acuminatus vel abrupte acuminatus*, *acumine obtuso*, *basi acutus vel acuminatus*, *membranaceus*, *integer*, *supra viridis*, *sublucidus*, minute *puberulus vel fere glaber*, *nervis vix prominulis*, *subtus paullo pallidior*, *ad nervos hirtellus*, *inter nervos puberulus*, *costa gracili*, *elevata*, *nervis lateralibus utroque latere 5-6*, *angulo acuto adscendentibus*, *arcuatis*, *prope marginem conjunctis*, *nervulis inconspicuis*; *racemi terminales*, *multiflori*, *pedunculo brevi adjecto 6-10 cm. longi*, *rhachi hirtella*, *pedicellis c. 1 mm. longis*, *bracteis linearisubulatis*, *pedicellos vix superantibus*; *calyx 4.5-5 mm. longus*, *cylindraceo-campanulatus*, *basi acutiusculus*, *sparse hirtellus*, *remote denticulatus*; *corolla c. 7 mm. longa*, *tubo calyce vix longiore*, *glabro*, *lobis rotundatis*, *sparse et minute puberulis*.—British Honduras: Tower Hill, 1928, J. S. Karling 9 (Herb. Field Mus. No. 579,931, type).

Citharexylum hirtellum is a close relative of *C. Berlandieri* Rob., but that species differs in its thick, conspicuously veined, densely velvety-pubescent leaves and slightly shorter, densely hirtellous calyx.

LABIATAE

***Scutellaria racemosa* Pers.**—This species is widely distributed in central and southern Mexico and in South America, having been described from Montevideo, Uruguay, but it has not been reported from Central America. It was collected by the writer at Siguatepeque, Honduras, altitude 1,080 meters, in February, 1928, No. 55,964. It is common about Siguatepeque, growing in low wet places on the plains.

***Sphacele pinetorum* Standl., sp. nov.**—*Frutex ramosus 1.5 m. altus*, *ramulis gracilibus*, *obtuse tetragonis*, *vetustioribus ferrugineo-*

brunneis, glabratis, novellis villosis et viscido-puberulis, internodiis elongatis; folia sessilia, linear-lanceolata, 12-18 cm. longa, 1.7-2.7 cm. lata, versus apicem longe attenuata, versus basin attenuata, basi ipsa rotundata et subamplexicaulis, repando-denticulata, crassa, supra viridia, primo villosa et glanduloso-scaberula, cito glabrata, nitidula, nervulis prominulis, reticulatis, subtus paullo pallidiora, primo ad nervos sparse villosa et ubique minute viscido-puberula, mox glabrata, puncticulata, costa crassa, elevata, nervis prominentibus, reticulatis; flores laxe paniculati, paniculis terminalibus, 18-28 cm. longis, 4-13 cm. latis, multifloris, ramulis dense et minutissime viscido-puberulis, bracteis linear-lanceolatis, patentibus, 3-14 mm. longis, pedicellis plerumque 5-8 mm. longis; calyx campanulatus, anthesi 4 mm. longus, 10-nervius, dense glanduloso-puberulus, obscure bilabiatus, 5-dentatus, dentibus tubo multo brevioribus, trianguli-ovatis, acuminatis, intus glanduloso-puberulis, calyce fructifero ampliato, 6-7 mm. longo; corolla punicea, 14 mm. longa, extus minute puberula, tubo superne ampliato, fauce 4-5 mm. lato, lobis inaequalibus, 1.5-2.5 mm. longis, rotundatis; stamina 4, exserta, subaequalia, subadscendentia, filamentis gracilibus glabris, antherarum loculis oblongis, divergentibus, subcurvatis; stylus glaber; nuculae suborbiculares, compressae, 2 mm. latae, laeves, glabrae.—Mexico: Dry clay hillsides in pine forest, Loma de Garrote, trail to San Sebastián, Sierra Madre Occidental, Jalisco, alt. 1,500 m., February 8, 1927, *Ynes Mexia 1649* (Herb. Field Mus. No. 579,807, type).

Flowers brick-red.

Sphacele pinetorum f. *flaviflora* Standl., f. nov.—Corolla flava; ceteris formae typicae omnino similis.—Mexico: Dry clayey steep hillside in pine forest, San Sebastián, trail to Loma de Garrote, Jalisco, alt. 1,500 m., February 8, 1927, *Ynes Mexia 1649c* (Herb. Field Mus. No. 579,806, type).

From Mexico there are known only two other species of *Sphacele*, both of which have triangular-hastate, stellate-tomentose leaves.

SOLANACEAE

Cyphomandra caudata Standl., sp. nov.—Arbor parva 3 m alta, trunco 5 cm. diam., ramulis subteretibus, pallide viridibus, punctulis minutis albidis notatis, sparse pilis longis patentibus albidis mollibus paucicellularibus villosis, internodiis elongatis; folia pinnata, petiolo 2.5-6 cm. longo, rhachi 2-2.5 cm. longa; foliola plerumque 5, rarius 7, subopposita, inaequallia, inferioribus minoribus, petiolulatis, petiolulo 2-4 mm. longo, superioribus sessilibus vel breviter petiolulatis, foliolo terminali longipetiolato, petiolulo 5-9 mm. longo, limbo ovato-oblongo, obovato-oblongo, vel obovato, apice longe et abrupte caudato-acuminato, acumine 2-4.5 cm. longo, longe filiformi-attenuato, basi rotundato vel obtuso et saepe obliquo, integro, tenuiter

membranaceo, laete viridi, supra sparse pilis longis albidis villoso, subtus ad ad nervos villoso, costa gracili, elevata, nervis lateralibus utroque latere 6-9, angulo acuto adscendentibus, arcuatis; cymae longipedunculatae, pedunculo gracillimo, 19 cm. longo, sparse villoso vel glabratu, ramulis paucis, remote multifloris, gracillimus, 8-14 cm. longis, flexuosis, pedicellis gracilibus, 10-15 mm. longis, glaberratis; calyx 2 mm. longus, 4 mm. latus, puberulus, 5-lobatus, lobis ovato-triangularibus, acutiusculis; corolla 1 cm. longa, extus dense et minute puberula, lobis tubo paullo longioribus, triangulare-ovatis, ad apicem obtusum attenuatis; filamenta crassa, 1 mm. longa, antheris 4 mm. longis, connectivo incrassato, basi infra cellulas producto; ovarium ovoideum, 2.5 mm. longum, glabrum, stylo 5.5 mm. longo, valido, supra clavato-incrassato, apice truncato; bacca ovalis, 3 cm. longa, glabra.—Panama: Daytona Farm, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 398 (Herb. Field Mus. No. 579,172, type).

“Wild cucumber.” A low tree with spreading crown. Flower buds purplish.

The species is well marked among the Central American representatives of the genus by its thin pinnate leaves.

Capsicum asterotrichum Standl., sp. nov.—Arbor parva 4.5 m. alta, ramulis flexuosis, crassis, obtuse angulatis, pilis stellatis stipitatis dense villosis, internodiis 4-5 cm. longis; folia paris valde inaequalia; folia majora: petiolus 2-2.5 cm. longus, validus, dense stellato-vilosus; limbus ovatus vel ovato-ellipticus, 10-16.5 cm. longus, 4-9 cm. latus, acuminatus, basi oblique acutus, obtusus, vel rotundatus, integer, membranaceus, supra viridis, sparse pilis simplicibus et alteris stipitato-stellatis indutus, subtus pallidior, stellato-vilosus, costa gracili, nervis lateralibus utroque latere c. 7, angulo acuto adscendentibus, arcuatis, prope marginem laxe conjunctis; folia minora: petiolus 4-6 mm. longus; limbus late ovatus, 4-5.5 cm. longus, 2.5-3.7 cm. latus, acutus vel acutiusculus; flores umbellati, umbellis axillaribus, sessilibus, solitariis, multifloris, pedicellis gracilibus, 8-15 mm. longis, sparse pilis stipitato-stellatis villosis; calyx late campanulatus, 2 mm. altus, 2.5-3 mm. latus, stellato-vilosus, truncatus, remote denticulatus; bacca globosa, aurantiaco-rubra, 5 mm. diam., villosa; semina numerosa, obovoidea, 1.4 mm. longa, brunnescens, foveolata.—Panama: Farm Eight pasture, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 576; Yale No. 12,209 (Herb. Field Mus. No. 579,693, type).

Among the Central American representatives of the genus *Capsicum* this plant is easy to recognize because of the copious coarse pubescence, consisting of several-rayed stipitate hairs.

Lycianthes variifolia Standl., sp. nov.—Ramuli graciles, teretes, ochracei, minute stellato-puberuli, internodiis brevibus; folia sparsa vel opposita, inaequalia, petiolo gracili, 3-10 mm. longo, supra late

sulcato, pilis stellatis minutis ferrugineis puberulo; limbus ovatus, ovalis, obovatus vel rarius late ellipticus, 2-7 cm. longus, 1.5-3 cm. latus, apice obtusus vel rotundatus, basi obtusus vel rarius acutus et saepe inaequalis, membranaceus, integer, supra viridis, sparse et minutissime stellato-puberulus, subtus paulo pallidior, dense pilis pauciradiatis stellato-pubescentes, costa gracili, elevata, nervis lateralibus utroque latere 4-5, angulo acuto adscendentibus, gracillimus, leviter curvatis, prope marginem laxe junctis; flores in axillis umbellati, umbellis sessilibus, paucifloris, pedicellis 4-10 mm. longis, stellato-puberulis; calyx campanulatus, 4 mm. longus, basi rotundatus, sparse et minutissime stellato-puberulus, truncatus, paulo infra marginem appendicibus c. 10 crassis teretibus obtusis 1.5-2 mm. longis onustus; corolla 8-9 mm. longa, subrotata, extus in alabastro dense stellato-tomentosa; antherae oblongae, 4 mm. longae, glabrae, filamentis brevibus, glabris.—British Honduras: Tower Hill, 1928, J. S. Karling 13 (Herb. Field Mus. No. 579,929, type).

The small leaves of this species, obtuse or rounded at apex, are distinctive.

Lycianthes cuneata Standl., sp. nov.—Arbor 6 m. alta, trunco 7.5 cm. diam., ramulis gracilibus, teretibus, ochraceis, ad apicem minutissime puberulis vel glabratis, internodiis 1.5-3 cm. longis; folia inaequalia; folia majora: petiolus 8-15 mm. longus, validus, minutissime puberulus; limbus oblique obovatus vel obovato-ellipticus, 7.5-11 cm. longus, 3.5-6 cm. latus, apice obtusus vel rotundatus et plerumque brevissime et abrupte apiculato-acuminatus, basi oblique cuneato-acutus vel attenuatus, integer, membranaceus, supra viridis, glaber, nervis non elevatis, subtus paulo pallidior, ad nervos minutissime griseo-puberulus, costa gracili, elevata, nervis lateralibus utroque latere c. 7, angulo acuto adscendentibus, leviter arcuatis; folia minora: petiolus 4-6 mm. longus; limbus obovato-rotundatus, 3.5-5 cm. longus, 2.5-3.5 cm. latus, apice late rotundatus, basi obtusus; cymae axillares, solitariae, umbelliformes, pauciflorae, pedunculo 5-12 mm. longo, pedicellis gracilibus, 8-11 mm. longis, glabris; calyx late campanulatus, 2 mm. longus, 3 mm. latus, glaber, limbo truncato, obsolete ciliolato; corolla flavescens, 1 cm. longa, glabra, tubo 3.5 mm. longo, lobis lineari-oblongis, ad apicem attenuatis, marginibus minute papillosis; filaments glabra, 2.5 mm. longa, antheris 2 mm. longis; ovarium glabrum.—Panama: Research Lagoon, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 405 (Herb. Field Mus. No. 579,181, type).

A tree with divided trunk and spreading crown.

Capsicum malacophyllum Standl., sp. nov.—Herba ramosa, ramis crassiusculis, flexuosis, dense breviterque villosis, viridibus, internodiis elongatis; folia solitaria, inaequalia, petiolo 1.5-5 cm. longo, gracili, dense breviterque villosa; limbus ovatus, late elliptico-ovatus, vel rotundato-ovatus, 4.5-14 cm. longus, 3-9.5 cm. latus, abrupte

acuminatus, acumine triangulari, acuto, basi late rotundatus et saepe inaequalis, tenuiter membranaceus, integer vel undulatus, fere concolor, utrinque sed subtus magis dense pilis brevibus mollibus albidis patentibus villosus, nervis lateralibus utroque latere c. 7, angulo acuto adscendentibus; flores ad axillas solitarii vel fasciculati, pedicellis gracilibus, 1.5-2 cm. longis, dense breviterque glandulosos-villosis; calyx campanulatus, 4 mm. longus, fructifer auctus, 8 mm. longus et adpressus, dense breviterque viscido-vilosus, fere ad medium 5-lobatus, lobis triangularibus, acutiusculis; corolla flava, 9 mm. longa, ad medium 5-fida, lobis lanceolato-oblongis, obtusis, extus villosulis, tubo intus ad insertionem staminum villoso; stamina paullo infra medium corollae tubi inserta, filamentis crassis, glabris, 2 mm. longis, antheris oblongis, 2 mm. longis, obtusis, loculis rima longitudinali dehiscentibus; bacca subglobosa, 8-10 mm. lata, glabra; semina numerosa, obovoidea, brunnea, 1.2 mm. longa, reticulato-foveolata.—Mexico: Stream side, San Sebastián to Hacienda del Otatal, Sierra Madre Occidental, Jalisco, alt. 1,425 m., March 2, 1927, *Ynes Mexia* 1780 (Herb. Field Mus. No. 579,893, type).

In general appearance this plant resembles closely *Lycianthes Pringlei* (Rob. & Greenm.) Bitter, but evidently it is referable rather to the genus *Capsicum*.

Solanum Mexiae Standl., sp. nov.—Frutex inermis, ramulis validis, 2-4.5 mm. crassis, subteretibus, dense foliatis, dense pilis stellatis albidis stipitatis tomentosis; folia inaequalia; folia majora: petioli validi, 10-14 mm. longi, supra anguste sulcati, dense stellato-tomentosi; limbus oblongo-ovatus, 5.5-7.5 cm. longus, 1.8-3.5 cm. latus, versus apicem obtusum angustatus, basi acutus et abrupte contractus, longe decurrens, integer, membranaceus, supra viridis, pilis minutis breviter stipitatis plerumque bifurcatis, ad nervos magis dense, conspersus, nervis inconspicuis, vix elevatis, subtus dense stellato-tomentosus, costa valida, elevata, nervis lateralibus utroque latere c. 8, adscendentibus, arcuatis; folia minora: petioli 4-5 mm. longi; limbus late ovatus, 1.5-3 cm. longus, 1-1.8 cm. latus, apice obtusus vel rotundatus, basi abrupte contractus et decurrens; pedicelli supra-axillares, solitarii, crassi, 5-7 mm. longi, dense stellato-tomentosi; calyx 3 mm. longus, profunde 5-lobatus, lobis ovato-oblongis, obtusis, stellato-tomentosis; bacca globosa, 9 mm. diam., apice rotundata, laevis, glabra; semina numerosa, valde compressa, margine incrassato.—Mexico: Rocky volcanic hillside, Ojos de Agua, near Ixtlán del Río, Nayarit, alt. 1,100 m., September 23, 1926, *Ynes Mexia* 742 (Herb. Field Mus. No. 579,909, type).

BIGNONIACEAE

Phryganocodia brevicalyx Standl., sp. nov.—Ramuli graciles, subteretes, ochracei, striati, dense elevato-lenticellati, internodiis brevibus; folia 2-foliolata, petiolo 4-14 mm. longo, sparse puberulo vel glabro, petiolulis 5-12 mm. longis, supra canaliculatis et dense breviterque hirtellis; foliola elliptico-oblonga, 5.5-9 cm. longa, 3-5

cm. lata, prope apicem obtusum et saepe emarginatum paullo angustata, basi breviter cordata vel anguste rotundata, subcoriacea, lucida, glabra, supra griseo-viridia, nervis prominulis, utrinque puncticulata, subtus paullo pallidiora, costa crassiuscula, elevata, nervis lateralis utroque latere 6-8, angulo lato adscendentibus, inaequalibus, curvatis vel fere rectis, remote a margine laxe conjunctis, nervulis prominulis, dense reticulatis; flores breviter racemosi, racemis terminalibus, laxe paucifloris, pedunculatis, foliis brevioribus vel aequi-longis, pedicellis gracilibus, 7-12 mm. longis, glabris, bracteolis 1-2 subulatis minutis onustis, bracteis minutis, subulatis; calyx membranaceus, in alabastro clausus, per anthesin uno latere fere ad medium fissus, spathaceus, c. 17 mm. longus, pruinoso-puberulus vel fere glaber; corolla 5 cm. longa, extus sparse pilis gracillimis villosula, tubo superne ampliato, fauce c. 1.3 cm. lato, lobis, c. 12 mm. longis, rotundatis; discus annularis, 0.8 mm. altus; ovarium glabrum, oblongum, stylo gracili, glabro, 3 cm. longo.—British Honduras: Tower Hill, 1928, J. S. Karling 39 (Herb. Field Mus. No. 579,925, type).

The only other Central American species, *P. corymbosa* (Vent.) Bur., differs in its much larger calyx and larger corolla.

Anemopaegma macrocarpa Standl., sp. nov.—Frutex scandens, cirrhiferus, ramulis gracilibus, teretibus, rimosis, viridescentibus, sparse et minute puberulis, ad nodos incrassatis, internodiis elongatis; folia 2-3-foliolata, opposita, petiolo 2.5-3 cm. longo, gracili, sparse et minute puberulo, appendicibus axillaribus stipuliformibus, late ellipticis, 1 cm. longis, acutiusculis, herbaceis, sessilibus; foliola petiolulata, petiolulo 8-10 mm. longo, sparse puberulo, limbo lanceolato-oblongo, 8.5-13.5 cm. longo, 3-4.8 cm. lato, longe acuminato, acumine obtuso, basi obtuso vel fere rotundato, integro, crasse membranaceo, glabro, utrinque dense impresso-punctulato, supra viridi, nitidulo, nervis prominulis, subtus vix pallidiore, costa gracili, elevata, nervis lateralis utroque latere c. 8, angulo lato divergentibus, arcuatis; cymae axillares, solitariae, c. 3-florae, pedunculatae, pedunculo 1.8 cm. longo, pedicellis 8-15 mm. longis, minute puberulis; calyx campanulatus, 9-10 mm. longus, 8 mm. latus, basi obtusus, punctulatus, limbo truncato, ciliolato; corolla lutea, 4.5 cm. longa, extus glabra, intus infra insertionem staminum breviter villosa, tubo basi 4 mm. crasso, fauce 1 cm. lato, lobis c. 1 cm. longis; stamina inaequalia, ad apicem corollae partis angustatae inserta, filamentis gracilibus, glabris, 14-22 mm. longis, antherarum thecis pendulis, leviter arcuatis, 5 mm. longis, glabris; discus semiglobosus, 2.5 mm. latus, glaber; ovarium glabrum, stylo gracili, 3.5 cm. longo, stigmate 3 mm. longo; capsula compressa, elliptico-oblonga, laevis, glabra, 12.5 cm. longa, 3.5-4 cm. lata, versus apicem et basin abrupte acuminata; semina numerosa, suborbicularia, compressa, 1.5-2.5 cm. lata.—Panama: Cricamola Valley, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 202 (Herb. Field Mus. No. 579,497, type).

This plant is closely related to *A. punctulatum* Pitt. & Standl., of Panama and Costa Rica, but in that species the corolla is 7.5-8.5 cm. long.

Parmentiera macrophylla Standl., sp. nov.—Arbor 6 m. alta, trunco 7.5 cm. diam., ramulis gracilibus, teretibus, ochraceis, rimosis, glabris, lenticellis numerosis elevatis notatis, internodiis elongatis; folia opposita, trifoliolata, longe petiolata, petiolo 7.5-10 cm. longo, subtereti, supra anguste canaliculato, glabro, apice paullo incrassato; foliola longe petiolulata, petiolulo 1.3-3.5 cm. longo, gracili, basi incrassato, limbo anguste elliptico, ovato-elliptico, vel obovato-elliptico, 11-14 cm. longo, 5-6 cm. lato, abrupte acuminato, acumine anguste triangulari, attenuato, basi acuto et abrupte decurrente, integro, membranaceo, supra viridi, glabro, nervis prominulis, subitus pallidiore, minute albido-lepidoto, costa gracili, elevata, axillis domat- iatis, nervis lateralibus utroque latere 6-7, angulo acuto adscendentibus, leviter arcuatis, pallidis, prope marginem laxe conjunctis; flores ad truncum fasciculati, pedicellis c. 1.5 cm. longis, glabris; calyx spathaceus, 3.3 cm. longus, glaber, uno latere ad basin partitus; corolla 5.5 cm. longa, glabra, tubo basi 1.2 cm. lato; stamina inae- qualia, filamentis gracilibus, sparse pilosulis, antheris 4 mm. longis.—Panama: Daytona Farm, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 402 (Herb. Field Mus. No. 579,184, type).

"Wild calabash." A small tree with clean bole. Flowers and fruits borne from pads on the main bole.

Perhaps most closely related to *P. edulis* DC., but in that the leaflets are much smaller and not lepidote, and the lateral ones are sessile.

ACANTHACEAE

Ruellia praecilaria Standl., sp. nov.—Frutex, ramulis subteretibus, 6 mm. crassis, glabratis; petioli 3.5 cm. longi, graciles, sparse albido- hirsuti, supra sulcati; limbus oblanceolato-oblongus, 27-29 cm. longus, 8 cm. latus, apice abrupte acuminatus, acumine angusto, 3 cm. longo, attenuato-acuto, ad basin acuminatam longe angustatus, membranaceus, supra viridis, rhaphidibus brevibus linearibus crebris notatus, subitus paullo pallidior, sparse strigilosus, ad nervos stri- gosus, costa crassa, elevata, nervis lateralibus utroque latere c. 14, angulo lato adscendentibus, arcuatis, prope marginem laxe conjunctis; flores axillares, solitarii, pedicello 4 mm. longo, breviter piloso, bracteis linearibus, calyce dimidio brevioribus; calyx fere ad basin partitus, lobis anguste linearibus, 3-3.5 cm. longis, 1 mm. latis, viridibus, adpresso-hispidulis; corolla alba, 9 cm. longa, extus breviter glanduloso-villosula, tubo basi 4 mm. crasso, parte angusta 4 cm. longa, prope medium abrupte expanso, parte expansa 3.5 cm. longa, 12 mm. lata, limbo 5-lobato, lobis subaequalibus, rotundatis, 2 cm. longis, apice rotundatis, intus glabris; stamina inclusa, fila-

mentis gracillimus, hirtellis, superne glabris, antheris linearibus, 6 mm. longis; stylus gracillimus, 6 cm. longus, pilis adscendentibus hirtellus, stigmate 3 mm. longo; ovarium dense pilis brevibus patentibus pilosum.—Panama: Buena Vista, Chiriquí Trail, 1928, G. P. Cooper 216 (Herb. Field Mus. No. 579,290, type).

The species is well marked by the large leaves and very long, white corolla.

RUBIACEAE

Alseis Eggertii Standl., sp. nov.—Ramuli novelli crassi, compressi, ochracei, glabri vel glabratii, internodiis elongatis; stipulae non visae; petioli c. 1 cm. longi, subteretes, supra canaliculati, glabratii; limbus elliptico-obovatus, acuminatus, basi obtusus et breviter decurrentes, tenuis, supra glaber vel ad nervos obscure puberulus, subtus pilis mollibus patentibus pilosus, nervis lateralibus elevatis, numerosis, leviter arcuatis; spicae axillares, simplices vel pauciramosae, 13-17 cm. longae, densiflorae, pedunculatae, pedunculo 4-4.5 cm. longo, floribus sessilibus, rhachi pilis minutis patentibus vel subadpressis pilosa; capsulae anguste cylindrico-clavatae, 8-11 mm. longae, 2 mm. crassae, versus basin attenuatae, apice obtusae, brunneae, puberulae vel glabratae.—Ecuador: El Recreo, April 29, Eggers 15,738 (Herb. Field Mus. No. 143,303, type).

The material at hand is fragmentary, no complete leaves being present, but it seems to indicate a species distinct from any of those known from Brazil or Colombia.

Condaminea breviflora Standl., sp. nov.—Omino glabra; ramuli crassiusculi, subteretes, rimosi, ochracei, internodiis brevibus; stipulae persistentes, 2-3 cm. longae, bifidae, lobis erectis, linearilanceolatis, longiattenuatis, venulosis; petioli crassi, 6-9 mm. longi; limbus obovato-oblongus, 19-27 cm. longus, 8-10.5 cm. latus, abrupte breviterque acuminatus, acumine triangulari, obtuso, basin versus sensim angustatus, basi ipsa truncata vel rotundata, crasse papyraceus, costa et nervis supra prominulis, subtus elevatis, nervis lateralis utroque latere c. 18, angulo lato divergentibus, leviter arcuatis, juxta marginem conjunctis; corymbus terminalis, trichotomus, 13.5 cm. longe pedunculatus, ramis primariis 12-13 cm. longis, pedicellis crassis, 2-5 mm. longis; hypanthium clavatum, 6-7 mm. longum, apice 3 mm. latum, basi acutum; calyx 4 mm. longus, 7 mm. latus, truncatus; corollae tubus 1 cm. longus, 5 mm. latus, intus sparse villosus, lobis oblongis, 7 mm. longis, obtusis; antherae anguste oblongae, 6 mm. longae, exsertae; stylus crassiusculus, glaber, 13 mm. longus.—Ecuador: Zamora, eastern slopes of eastern Andes of Loja, alt. 800-1,200 m., F. C. Lehmann 5651 (Herb. Field Mus. No. 578,485, type).

Evidently related to *C. corymbosa* (R. & P.) DC., which differs in its larger flowers and nearly sessile leaves.

Oregandra Standl., gen. nov.—Arbores glabrae; folia opposita, breviter petiolata, integra; stipulae deciduae; flores in paniculas terminales multifloras dispositi, pedicellati; hypanthium obovoideum; calyx brevis, 5-denticulatus; corolla cylindraceo-campanulata, tubo obconico, intus glabro, lobis 5, brevibus, rotundatis, imbricatis, uno exteriore; stamina 5, prope basin tubi inserta, filamentis exsertis, glabris, antheris majusculis, versatilibus, linearibus, basi profunde bifidis; discus magnus, tumidus; ovarium 2-loculare, stylo gracili, glabro, stigmatibus brevibus, linearibus, ovulis numerosis.

Type species, *Oregandra panamensis* Standl.

Oregandra panamensis Standl., sp. nov.—Arbor omnino glabra, ramulis crassis, teretibus vel compressiusculis, ochraceis vel novellis fuscis, sparse et minute lenticellatis, internodiis 2.5-11 cm. longis; stipulae non visae; petiolus crassus, 1-1.5 cm. longus, supra sulcatus; limbus oblongus, obovato-oblongus vel rarius ovatus, 14-22 cm. longus, 5.5-11.5 cm. latus, apice acutus vel subabrupte et brevissime acuminatus, acumine obtuso, basi acutus vel subrotundatus, subcoriaceus, supra viridis, nervis subimpressis, subtus paullo pallidior, costa crassiuscula, elevata, nervis lateralibus utroque latere 8-9, angulo angusto adscendentibus, fere rectis, prope marginem laxe conjunctis, nervulis obsoletis, margine subrevoluto; flores cymoso-paniculati, panicula multiflora, 6.5-7.5 cm. longa, 8-11 cm. lata, decussata, longipedunculata, pedunculo 8-9 cm. longo, cymulis densis, bracteis minutis, triangulari-acuminatis, pedicellis crassis, 2-4 mm. longis; calyx 1.5 altus, 2.5-3 mm. latus, remote 5-denticulatus; corollae tubus 3.5 mm. longus, basi 1.5 mm. latus, ore 3 mm. latus, intus glaber, lobis 1.5-2 mm. longis; filamenta c. 4 mm. longa, gracilia, glabra, paullo exserta, antheris linearibus, dorsifixis, 3 mm. longis; stylus 6 mm. longus, stigmatibus 0.8 mm. longis.—Panama: Talamanca Valley, 1927, G. P. Cooper and G. M. Slater 144; Yale No. 10,490 (Herb. Field Mus. No. 573,817, type), 149 (Yale No. 10,495).

Since mature fruit is not available, and all the ovaries are very young, the proper tribal position of this tree can not be determined satisfactorily. At first I was inclined to refer it to the genus *Sickingia*, to which it appears to be closely related. In that group, however, the corolla lobes are valvate, and the corolla tube is villous or barbate within.

Chimarrhis latifolia Standl., sp. nov.—Arbor 23 m. alta, trunco 45 cm. diam., ramulis 7-9 mm. crassis, subteretibus vel compressiusculis, ochraceis, rimosis, novellis gracilioribus, glabratis, internodiis plerumque 1-2.5 cm. longis; stipulae oblongo-triangulares, 2 cm. longae, acuminatae, crassae, deciduae, obscure et minute puberulae vel fere glabrae; folia opposita, petiolo 3.5-4 cm. longo, valido, supra plano, glabratu; limbus late obovato-ellipticus, 13.5-20 cm. longus, 8.5-11 cm. latus, apice obtusus vel rotundatus et interdum

acuminato-apiculatus, acumine 5-6 mm. longo, late triangulari, obtuso, basi subabrupte angustatus et acutus, crasse membranaceus, supra viridis, glaber, costa et nervis conspicuis sed non elevatis, subtus paullo pallidior, ad axillas breviter barbatus vel fere omnino glaber, costa gracili, elevata, nervis lateralibus utroque latere c. 11, gracilibus, prominentibus, angulo acuto adscendentibus, subarcuatis, juxta marginem conjunctis, nervulis inconspicuis; flores cymoso-corymbosi, corymbis dense multifloris, c. 2.5 cm. longis et 6 cm. latis, pedunculo 3 cm. longo, ramulis glabratiss, pedicellis 1 mm. longis vel floribus sessilibus; capsula 5 mm. longa, fusca, glabra, obscure costata.—Panama: Progreso, Chiriquí, July-August, 1927, G. P. Cooper and G. M. Slaier 260; Yale No. 10,613 (Herb. Field Mus. No. 573,160, type). Duplicate of type in U. S. Nat. Herb.

“Jagua amarilla.” A large tree with high buttresses. Wood yellow, heavy and hard to split, the grain very crooked and crossed.

Chimarrhis latifolia is related to the recently described *C. parviflora* Standl., the latter differing in its smaller narrower leaves, on shorter petioles, and in its much smaller capsules.

Schizocalyx hirsutus Standl., sp. nov.—Arbor, ramulis crassiusculis, cortice brunnescente obtectis, pilis adscendentibus vel patentibus dense hirsutis, internodiis brevibus; folia opposita, petiolo crasso, c. 5 mm. longo, hirsuto; limbus oblanceolato-oblongus, 14-24 cm. longus, 6-7 cm. latus, abrupte acuminatus, acumine c. 1.5 cm. longo, anguste triangulari, acuminato, basin versus angustatus, basi ipsa obtusa vel acuta, membranaceus, supra viridis, sparse hirsutus, costa paullo elevata, nervis non elevatis, subtus paullo pallidior, undique pilis patentibus gracilibus rigidis hirsutus, costa gracili, elevata, nervis lateralibus utroque latere c. 19, angulo lato adscendentibus, gracillimi, elevatis, arcuatis, prope marginem conjunctis; flores cymoso-paniculati, panicula terminali, c. 10 cm. longa et 15 cm. lata, pauciramosa, 5 cm. longe pedunculata, ramis primaris oppositis, divaricatis, 2-4.5 cm. longis, dense hirsutis, apice trichotomis, ramulis cymulis densis paucifloris terminatis; pedicelli 3-5 mm. longi, hirtelli; bracteae primariae foliaceae, rhombico-ellipticae, c. 1 cm. longae et 6 mm. latae, basi abrupte in petiolum 1 cm. longum contractae, bracteis cymularum lanceolatis vel lanceolato-linearibus, 3-9 mm. longis, adpresso-pilosus; hypanthium obconicum, 3 mm. longum, basi acutiusculum, dense adpresso-pilosum; calyx 4-5 mm. longus, in alabastro clausus, corolla erumpente fissus et denique fere ad basin bilobus, lobis acutis vel obtusiusculis, persistentibus, extus pilis griseis adscendentibus dense obtectis, intus glabris, calycis lobo uno interdum in limbum magnum album 2 cm. longe petiolatum expanso, limbo late elliptico, c. 7 cm. longo et 5 cm. lato, basi et apice rotundato, venoso, utrinque pilis subadpressis brevibus hirsuto; corolla tubulosa, infundibuliformis, extus glabra, tubo 8 mm. longo, superne vix dilatato, intus supra insertionem staminum breviter villosa, lobis rotundatis, recurvis, glabris; stamina

supra medium tubi inserta, filamentis e corolla breviter exsertis, inferne villosulis, superne glabris, antheris oblongis, 2.5 mm. longis; stylus gracilis, superne pilulis paucis brevibus adpressis indutus, 8 mm. longus, stigmatis ramulis linearibus, recurvis, fere 2 mm. longis.—Colombia: Between Narino and El Tambor, Dept. Santander, in thickets along trail, alt. 150-300 m., December 4, 1926, E. P. Killip and Albert C. Smith 14,959 (U. S. Nat. Herb. No. 1,350,921, type).

I have seen no material of *S. bracteosus* Wedd., but the present plant, although clearly congeneric, does not agree with the description of that species in several important details. In *S. bracteosus* the leaves are described as ovate-oblong and puberulent beneath, glabrate above, terms which could scarcely be so misapplied as to refer to *S. hirsutus*; and the bracts are described as ovate and the hypanthium as oblong.

Rondeletia bertieroides Standl., sp. nov.—Arbor 6-metralis, trunco 7.5 cm. diam., ramulis gracilibus, subteretibus, rufobrunneis, novellis albido-tomentosis, cito glabratis, internodiis 1.5-5 cm. longis; stipulae 4-5 mm. longae, anguste triangulares, subulato-acuminatae, erectae, primo tomentosae, mox glabratae; petioli graciles, 7-10 mm. longi, glabri; limbus elliptico-oblongus vel ovato-oblongus, 8.5-13 cm. longus, 3-4.5 cm. latus, acuminatus vel longiacuminatus, acumine saepe falcato, acutiusculo, basi acutus, membranaceus, supra viridis, glaber, subtus pallidior, statu juvenili sparse tomentosus, cito glabratus, costa gracili, elevata, nervis lateralibus utroque latere c. 9, angulo acuto adscendentibus, leviter curvatis, prope marginem conjunctis; inflorescentia terminalis, cymoso-paniculata, panicula thyrsiformi, c. 11 cm. longa et 5 cm. lata, pedunculata vel e basi ramosa, ramulis tenuiter tomentellis, bracteis primariis linearibus, ad 6 mm. longis, ceteris minutis, floribus ad ramulos sessilibus vel 1 mm. longe pedicellatis; hypanthium ellipsoideum, 1.5 mm. longum, albido-tomentosum; calycis lobi 4, maxime inaequales, lobis 3 triangularibus, acutis, vix 1 mm. longis, lobo quarto 2-2.5 mm. longo, rotundato-ovato, apice rotundato, herbaceo, sparse tomentello; corolla alba, sparse albido-tomentella, tubo gracili, 12 mm. longo, vix 1 mm. crasso, lobis 4, rotundatis, 2.5 mm. longis; capsula 4 mm. longa, costata.—Panama: Buena Vista Camp on Chiriquí Trail, alt. 900 m., 1928, G. P. Cooper 598; Yale No. 12,231 (Herb. Field Mus. No. 579,614, type).

Related to *R. aetheocalymna* Donn. Smith, of Guatemala, but in that the leaves are glabrous, the calyx lobes much longer, and the corolla tube only 7-8 mm. long.

Rondeletia Cooperi Standl., sp. nov.—Arbor 6-metralis, trunco 5 cm. diam., ramulis gracilibus, subteretibus, dense puberulis, internodiis elongatis; stipulae late triangulares, 2.5 mm. longae, acutae

vel acuminatae, extus et intus adpresso-pilosulae; petioli graciles, 5-6 mm. longi, puberuli; limbus oblongo-ellipticus vel ellipticus, 9-15 cm. longus, 4-5.5 cm. latus, abrupte acuminatus, acumine recto vel falcato, 1-1.5 cm. longo, obtuso, basi acutus vel longiattenuatus, membranaceus, supra viridis, glaber, nervis conspicuis sed non elevatis, subitus vix pallidior, ad nervos minute puberulus, costa gracili, elevata, nervis lateralibus gracillimus, angulo lato adscendentibus, arcuatis, juxta marginem conjunctis; flores cymoso-corymbosi, corymbis terminalibus, 3-6 cm. longis, 4-11 cm. latis, longipedunculatis, pedunculo 8-9 cm. longo, trichotomis, ramulis dense puberulis, cymis densis, paucifloris, floribus sessilibus vel 1 mm. longe pedicellatis; hypanthium oblongum, 2.5 mm. longum, dense pilis minutis griseis adscendentibus pilosulum; calycis lobi 4, valde inaequales, lobis 3 triangulari-oblongis, 1.5 mm. longis, obtusis, viridibus, erectis, lobo quarto ovato vel elliptico, 3-5 mm. longo, obtuso, viridi, adpresso-pilosulo; corolla alba, extus pilis minutis adpressis albidis dense obtecta, tubo 1 cm. longo, vix 1 mm. crasso, lobis 4, rotundatis, 4 mm. longis, extus versus marginem glabris.—Panama: Buena Vista Camp on Chiriquí Trail, alt. 375 m., 1928, G. P. Cooper 600; Yale No. 12,233 (Herb. Field Mus. No. 579,596, type).

According to the collector's notes, the flowers are fragrant, and the leaves are very glossy, but the latter character is not apparent in the dried specimens.

This species, also, is a relative of *R. aetheocalymna*, differing in the shorter corolla, thinner and glabrous leaves, and sessile or short-pedicled flowers. From *R. bertieroides* the present plant differs conspicuously in the broad cymose inflorescence, that of *R. bertieroides* being thyrsiform-paniculate.

Deppea macrocarpa Standl., sp. nov.—Frutex 0.6-1.2 m. altus, ramosus, ramulis gracilibus, subteretibus, rufo-brunneis, rimosis, glabris vel pilis paucis brevibus patentibus pilosulis, internodiis 1-2.5 cm. longis; stipulae erectae, persistentes, 2-2.5 mm. longae, triangulares vel late deltoideae, acutae; folia opposita, petiolis gracilibus, 1.2-3.5 cm. longis, sparse pilosis vel glabratis; limbus ovato-ellipticus vel oblongo-ellipticus, 6-11 cm. longus, 2.3-4 cm. latus, longiacuminatus, acumine 1.5-2 cm. longo, recto vel subfalcato, acutiusculo, basi acutus vel attenuatus, interdum abrupte acuminatus, membranaceus, ciliatus, supra viridis, sparsissime pilosus vel glaber, nervis non elevatis, subitus vix pallidior, ad nervos plus minusve pilis mollibus albidis adscendentibus villosulus vel fere glaber, costa gracili, elevata, nervis lateralibus utroque latere 8-9, angulo acuto adscendentibus, gracillimus, leviter arcuatis, juxta marginem laxe conjunctis; flores cymoso-paniculati, panicula terminali, c. 4 cm. longa et 4.5 cm. lata, laxe multiflora, dextussata, pedunculo 1.8 cm. longo, ramulis sparse pilosis, pedicellis gracilibus, 1-6 mm. longis, in fructu saepe ab apice recurvatis, sparse pilosis vel glabratis; calycis lobi persistentes, lineares, 2-3 mm. longi.

patentes vel recurvati, sparse pilosuli vel glabri, marginibus revolutis; capsula ovalis, bisulcata, 5-6 mm. longa, 4-4.5 mm. lata, brunnea, glabrata, obscure costata; semina numerosissima, minuta, angulata, brunnea.—Mexico: In thickets, Cerro de San Juan, west of Tepic, Nayarit, alt. 1,000 m., September 19, 1926, *Ynes Mexia* 727 (Herb. Field Mus. No. 579,908, type).

Vernacular name, "pie de pájaro."

Related to *D. pubescens* Hemsl., but in that the capsules are only 3 mm. long, and the calyx lobes are ovate-deltoid.

Deppea hameliooides Standl., sp. nov.—Frutex 0.25-1 m. altus, ramiculis gracilibus, teretibus, ochraceis vel brunnescensibus, minute puberulis, internodiis plerumque 1.3-6 cm. longis; stipulae triangulares, acutae, vix 1 mm. longae; petioli gracillimi, 1-4.8 cm. longi, puberuli; limbus ovatus vel ellipticus, 3.5-6.5 cm. longus, 1.5-3 cm. latus, acutus vel acutiusculus, basi acutus vel longe attenuatus, tenuiter membranaceus, supra viridis, sparse scaberulus vel glabratus, nigro-puncticulatus, subtus pallidior, praecipue ad nervos puberulus, costa gracillima, nervis lateralibus utroque latere 5-6, angulo acuto adscendentibus; flores cymoso-corymbosi, corymbis axillaribus, laxis, multifloris, folia fere aequantibus, 2.5-7 cm. latis, 1.5-4 cm. longis, longipedunculatis, pedunculo gracili, 2-3.5 cm. longo, pedicellis gracilibus, 6-12 mm. longis, sparse et minute puberulis vel glabratibus; calycis lobi ad apicem capsulae persistentes, triangulari-oblongi, c. 1 mm. longi; capsula ovalis, 4 mm. longa, 3 mm. lata, basi et apice rotundata, viridis, obscure costata, glabra vel obscure scaberula; semina numerosa, minute, brunnescens, reticulata.—Mexico: Stream bank, Segundo Arroyo, San Sebastián, Sierra Madre Occidental, Jalisco, alt. 1,500 m., *Ynes Mexia* 1546a (Herb. Field Mus. No. 579,899, type).

Distributed as *D. erythrorrhiza* Schlecht. & Cham., to which the plant is not closely related. Its nearest relatives are *D. pubescens* Hemsl., which has short villosulous petioles, shorter pedicels, and smaller capsules; and *D. macrocarpa*, described above, which is distinguished by its long calyx lobes.

Macrocnemum rotundatum Standl., sp. nov.—Ramuli crassiusculi, subcompressi, brunnei, glabri, internodiis 3.5-7 cm. longis; stipulae late ellipticae vel rotundatae, 1.5-2.3 cm. longae, 12-14 mm. latae, apice rotundatae, glabrae, brunnescentes, deciduae; petioli 3-10 mm. longi, glabri, graciles, supra late sulcati; limbus ovali-ovatus vel obovato-oblongus, in foliis minoribus interdum subrotundatus, 4.5-12.5 cm. longus, 3-6.5 cm. latus, apice rotundatus vel obtusissimus, basi acutus vel rarius obtusus vel rotundatus, crasse membranaceus, supra viridis, glaber, nervis vix elevatis, subtus brunnescens, glaber vel ad nervos strigilosus, in axillis saepe dense breviterque barbatus, costa gracili, elevata, nervis lateralibus

utroque latere c. 10, gracilibus, prominentibus, angulo acuto adscendentibus vel inferioribus divaricatis, leviter arcuatis, prope marginem laxe conjunctis; paniculae axillares, laxe pauci- vel multiflorae, 5-6.5 cm. longae, 5-8 cm. longe pedunculatae, basi foliaceo-bracteatae, bracteis ovatis, obtusis, 12-18 mm. longis, ramulis divaricatis, bifariam ferrugineo-puberulis, bracteis superioribus triangulari-ovatis, acuminatus, 2-4 mm. longis, glabris; hypanthium oblongum, 4.5 mm. longum, glabrum; calyx breviter 5-dentatus, dentibus latisimne triangularibus, acutis vel abrupte apiculatis; corolla extus glabra, tubo 7-8 mm. longo, 2.5 mm. lato, lobis reduplicato-valvatis, ovato-rotundatis, apice rotundatis, intus puberulis; stylus gracilis, glaber, 6-7 mm. longus; capsula immatura anguste oblongo-clavata, curva, 1.5 cm. longa, 3 mm. lata, basin versus attenuata, glabra.—Colombia: Buesaco, alt. 1,800-2,100 m., "June, July," F. C. Lehmann 6303 (Herb. Field Mus. No. 578,682, type).

From the present species *Macrocnemum grandiflorum* differs in its long corolla and acuminate leaves; *M. pubescens* (Benth.) Wedd. in its pubescent, acuminate leaves; and *M. pastoense* Karst. in its pubescent corolla.

Manettia asperifolia Standl., sp. nov.—Frutex volubilis, ramulis acute quadrangulatis, gracilibus, brunneis vel ochraceis, pilis brevibus recurvis dense indutis, internodiis elongatis; stipulae anguste triangulares, acutae, puberulæ, erectæ, persistentes; folia opposita, petiolo 3-6 mm. longo, dense et minute piloso; limbus ovatus, oblongo-ovatus, vel ellipticus, 2-6 cm. longus, 1-3 cm latus, acutus, abrupte acuminatus, vel rarius obtusus, basi rotundatus vel obtusus, crassus, utrinque dense asperulo-puberulus, nervis supra inconspicuis, subtus pallidior, costa et nervis elevatis, gracilibus, nervis lateralibus utroque latere 5-6, angulo acuto adscendentibus, arcuatis, marginem fere attingentibus; cymæ axillares, dense multifloræ, sessiles vel 2-3 mm. longe pedunculatae, pedicellis gracilibus, 4-10 mm. longis, dense breviterque pilosis; hypanthium obovoideum, 2-2.5 mm. longum, dense brunnescenti-pilosum; calyx plerumque 8-partitus, laciniis inaequalibus, viridibus, lanceolatis vel anguste ovatis, 3-6 mm. longis, acuminatis, prope basin sensim contractis, utrinque dense puberulæ; corolla rubra, extus subdense breviterque pilosula, tubo 12-22 mm. longo, basi 2.5 mm. lato, superne vix ampliato, fauce 3 mm. lato, in fauce densissime barbato, lobis obovato-rotundatis et interdum obtuse breviterque productis.—Bolivia: Yungas, alt. 1,800 m., 1885, H. H. Rusby 2159 (Herb. Field Mus. No. 164,361, type). In forests, Buenavista, Dept. Santa Cruz, alt. 400 m., Steinbach 5598, 7065.

The plant is exceptionally variable as to size of corolla, even upon the same branch, and the leaves also exhibit some variation in shape, but all these specimens are probably conspecific. *M. asperifolia* is related to the Peruvian *M. hispida* Poepp. & Endl., but that is described as having hispid branches and 1-5-flowered

inflorescences. It is stated, also, that the corolla is furnished with sparse stiff hairs; those upon the corolla of *M. asperifolia* are very slender and weak.

Manettia Bangii (Rusby) Standl., comb. nov. *Lygistum Bangii* Rusby, Mem. Torrey Club 3³: 43. 1893.

In his account of the Genus *Manettia* (p. 33. 1919) Wernham lists this plant as "*M. Bangii* Rusby, in Mem. Torr. Bot. Club III. iii. 43. (1893)," but Rusby published the name as "*Lygistum (Manettia) Bangii*," citing *Manettia* only as a generic synonym. It is evident, therefore, that Wernham's citation is a careless and incorrect one, and that a new transfer is necessary.

Manettia Lehmannii (Wernh.) Standl., comb. nov. *Neosabicea Lehmannii* Wernh. Journ. Bot. 52: 225. pl. 533. 1914.

Wernham referred his new genus, *Neosabicea*, to the tribe *Mussaendeae*, upon the presumption that the fruit was baccate, but this was only a guess, for he had not seen the fruit. Examination of the type collection, *Lehmann 3514* from Colombia, discloses no obvious reason for excluding the plant from the genus *Manettia*. Its general appearance is that of many other species of *Manettia*, and the structural details are those of that genus.

Manettia cryptantha Standl., sp. nov.—Frutex scandens, caulis subteretibus, fusco-olivaceis, dense et minute puberulis; stipulae subvaginantes, c. 1 mm. longae, latissime triangulares, laciniate-denticulatae; petioli 3-6 mm. longi, puberuli; limbus ovato-ellipticus vel oblongo-ovatus, 4-6 cm longus, 1-2 cm. latus, acute acuminatus, basi obtusus vel subrotundatus, membranaceus, fere concolor, supra glaber, nervis inconspicuis, subtus ad nervos sparse breviterque pilosus vel glabratus, costa et nervis gracilibus, prominulis, nervis lateribus utroque latere c. 8, angulo acuto adscendentibus, arcuatis; flores umbellato-cymosi, cymis axillaribus, solitariis, paucifloris, 1-1.5 cm. longe pedunculatis, foliis aequilongis vel brevioribus, bracteis magnis, foliaceis, lanceolatis, usque ad 1 cm. longis, pedicellis gracilibus, erectis; hypanthium 5-13 mm. longum, basi acutisculum, minute puberulum; calyx ad basin 4-partitus, laciniis lanceolatis vel lineari-lanceolatis, 5-8 mm. longis, acuminatis, viridibus, glabratibus; corolla alba, extus sparse puberula, tubo 7 mm. longo, 1.2 mm. lato, lobis 3 mm. longis, lanceolato-oblongis, obtusis, intus versus basin sparse breviterque villosis; capsula obovoidea, glabrata, 8 mm. longa, 6 mm. lata, basi acuta.—Colombia: In forest, Cordillera Oriental, east of Neiva, Dept. Huila, alt. 1,800-2,300 m., August 1-8, 1917, H. H. Rusby and F. W. Pennell 871 (Herb. N. Y. Bot. Gard., type), 879 (U. S., N. Y.), 648 (N. Y.).

In general appearance the plant resembles *M. Lehmannii* (Wernh.) Standl., but in that the pubescence is much more abundant and composed of longer hairs, and the corolla tube is conspicuously longer than the calyx segments. *M. cryptantha* is easily recognized by the unusual development of the calyx lobes, which are sometimes longer than the corolla.

Manettia vacillans Standl., sp. nov.—*Frutex scandens, caulis* vetustioribus subteretibus, ochraceis, novellis dense puberulis; *stipulae breviter vaginantes, acutae, 2 mm. longae, puberulae; petioli* 3-4 mm. longi, dense cano-puberuli; *limbus ovatus, late ovatus, vel ellipticus, 2.5-3.5 cm. longus, 1.2-2.2 cm. latus, breviter acuminatus* vel rarius tantum acutus vel obtusus, basi rotundatus vel obtusus et interdum abrupte contractus, membranaceus, supra viridis, statu juvenili sparse adpresso-pilosus, mox glabratus, subtus pallidior, tantum ad nervos sparse tomentulosus vel fere glaber, costa et nervis gracilibus, prominulis, nervis lateralibus utroque latere c. 5, angulo acuto adscendentibus, valde arcuatis, margine plana; *inflorescentiae axillares, umbellatim 1-3-florae, ad 1.5 cm. longe pedunculatae, umbella saepe basi bracteis 2 foliis conformibus 6-8 mm. longis fulcrata, pedicellis gracilibus, 3-8 mm. longis, cinereo-puberulis; hypanthium 2 mm. longum, tomentulosum; calyx ad basin divisus, lobis 8, rarius 4, 2.5-5 mm. longis, inaequalibus, lanceolatis vel ovatis, acuminatis, planis, prope basin contractis, patentibus vel recurvis, obscure tomentulosis vel fere glabris; corolla extus glabra, tubo 11-12 mm. longo, prope medium 1.5 mm. lato, insuper ampliato, fauce 5 mm. lato, lobis ovatis, obtusis, 3-5 mm. longis, intus minute tomentulosis.*—Peru: In moist ravine, mountains northeast of Huanta, Prov. Ayacucho, alt. 3,100-3,200 m., February, 1926, A. Weberbauer 7509 (Herb. Field Mus. No. 562,416, type).

Corolla reddish white, turning rose. A fragmentary specimen in the U. S. National Herbarium from Paucartambo Valley, alt. 3,500 m., F. L. Herrera 1404, is, apparently, conspecific. The species is well marked among the Peruvian *Manettias* by the pre-vailingly 8, broad, recurved calyx lobes and nearly glabrous foliage.

Manettia veronicoides Standl., sp. nov.—*Scandens, caulis* gracilibus, subteretibus, novellis sparse puberulis, mox glabratis; *stipulae vaginantes, vagina 2 mm. longa, parte libera late triangulari, acuminata, puberula; petiolus 2-3 mm. longus, villosulus vel glabratus; limbus ovatus vel lanceolato-ovatus, 2.3-4.5 cm. longus, 0.8-1.6 cm. latus, subabrupte et longissime acuminatus, basi rotundatus vel obtusus, crasse membranaceus, supra viridis, glaber, nervis conspicuus, subtus brunnescens, tantum ad costam sparse tomentulosus vel glaber, costa crassiuscula, elevata, nervis lateralibus utroque latere 5-6, angulo lato adscendentibus, valde arcuatis, gracilibus; flores umbellato-paniculati, paniculis terminalibus et axillaribus,*

angustis, laxe multifloris, foliatis vel nudis, bracteis saepe foliaceis et foliis conformibus, 2-8 mm. longis, umbellis paucifloris, pedicellis 2.5-4 mm. longis, puberulis; hypanthium obovoideum, 1-1.5 mm. longum, sparse puberulum; calyx 4-partitus, lobis oblongo-triangularibus, acutis, glabris, 1-1.5 mm. longis, erectis; corolla extus glabra, tubo 2.5 mm. longo, 1.5 mm. lato, lobis oblongis, obtusis, 2.5 mm. longis, intus minute tomentulosis; capsula obovoideo-globosa, 3-4 mm. longa, basi obtusa, atrobrunnea, glabra; semina compressa, 1.5 mm. longa, atro-brunnea, late alata.—Peru: Between the tambos Tres Cruces and Tambomayo, Prov. Paucartambo, Dept. Cuzco, alt. 2,400 m., May, 1914, A. Weberbauer 6971 (Herb. Field Mus. No. 548,961, type).

Manettia veronicoides, because of its very small corolla, must be closely related to *M. paniculata* Poepp. & Endl., also Peruvian, of which I have seen no material. The latter is described as being quite glabrous throughout, with leaves acute at base.

Manettia tomentulosa Standl., sp. nov.—Scandens, caulis gracilis, vetustioribus ochraceis, teretibus, novellis dense puberulis; stipulae breviter vaginantes, subtruncatae, mucronatae, laciniate-denticulatae; petiolus gracilis, 2-8 mm. longus, puberulus; limbus oblongo-ovatus, elliptico-oblongus, vel lanceolato-oblongus, 3-7 cm. longus, 1-3 cm. latus, abrupte et longiuscule acuminatus, basi rotundatus vel obtusus, crasse membranaceus, supra viridis, sparse et minute adpresso-pilosus vel glabratus, costa et nervis leviter impressis, subtus pallidus, minute et subdense tomentulosus, costa gracili, elevata, nervis lateralibus utroque latere c. 8, angulo acuto adscendentibus, arcuatis, prope marginem conjunctis, margine plana vel revoluta; flores umbellati, umbellis laxe paucifloris, axillaribus, breviter vel ad 6 mm. longe pedunculatis, paniculam terminalem angustam nudam vel foliatam efformantibus, pedicellis gracilis, 6-8 mm. longis, puberulis; capsula subglobosa, 3.5 mm. longa basi rotundata, minute puberula, obscure costata; calycis lobi 4, ad apicem capsulae persistentes, oblongi vel ovati, obtusi, erecti, 0.6 mm. longitudine vix superantes; semina compressa, 1.5 mm. longa, atro-brunnea, alata.—Peru: La Merced, Hacienda Schunke, alt. 1,200 m., August 27 to September 1, 1923, J. Francis Macbride 5772 (Herb. Field Mus. No. 536,802, type).

The corollas, which are important in determining the position of the species, are not known in the present plant. It can not be referred to any of the species previously reported from Peru, the chief distinguishing characters being the fine tomentum of the leaves and the minute calyx lobes.

Manettia Schunkei Standl., sp. nov.—Frutex scandens, caulis gracilis, quadrangulatis, vetustioribus ochraceis, novellis dense reflexo-hirtellis; stipulae triangulares, 1.5 mm. longae, acutae,

erectae, hirtellae; petiolus 4-8 mm. longus, gracilis, hirtellus; limbus lanceolato-ovatus vel ovato-ellipticus, 2.5-5.5 cm. longus, 1.3-2.5 cm. latus, sensim vel abrupte acuminatus, acumine acuto, basi rotundatus vel obtusus, crasse membranaceus, supra viridis, subnitidus, sparse scaberulus, costa impressa, nervis lateralibus obsoletis, nervulis plerumque prominulo-reticulatis, subtus pallidus, dense scaberulus, costa gracili, elevata, nervis lateralibus utroque latere c. 8, angulo lato adscendentibus, gracillimus, inconspicuis, margine anguste revoluta; cymae umbelliformes, in axillis sessiles vel brevissime pedunculatae, laxe pauciflorae, foliis multo breviores, pedicellis 3-7 mm. longis, breviter pilosis; hypanthium dense breviterque pilosum; calyx ad basin divisus, lobis 8, foliaceis, viridibus, lanceolatis vel ovatis, acutis vel acuminatis, puberulis, 3-4 mm. longis, basin versus in petiolulum contractis; corolla extus sparse puberula, tubo 13 mm. longo, 1.5 mm. lato, sparse dilatato, fauce 4 mm. lato, in fauce dense barbato, lobis ovato-oblongis, 6 mm. longis, 3 mm. latis, acutis, intus glabris.—Peru: Chanchamayo Valley, Dept. Junín, alt. 1,200 m., October, 1924-27, Carlos Schunke 362 (Herb. Field Mus. No. 571,416, type).

In Wernham's key to the species of "The Genus *Manettia*," this plant runs to *M. congesta* (Vell.) Schum., of Brazil, but in that the young stems and leaves are villous-pubescent.

Manettia peruviana Standl., sp. nov.—Frutex scandens, caulis vetustioribus subteretibus, gracilibus, ochraceis, novellis quadrangularibus, pilis brevibus pallidis dense villosis; stipulae basi vaginantes, parte libera triangulari, acuta, villosula, 2.5 mm. longa; petiolus 2-4 mm. longus, villosulus; limbus oblongo-ovatus, 2.5-4.5 cm. longus, 1-2.3 cm. latus, acutus vel breviter acuminatus acumine acuto vel acuminato, basi rotundatus, crasse membranaceus, supra viridis, scaber et sparse villosulo-puberulus, costa subimpressa, nervis obscuris, subtus dense tomentosus, tomento flavo-griseo, nitidulo, costa gracili, elevata, nervis lateralibus tomento fere occultis, margine revoluto; flores umbellati, umbellis laxe paucifloris, sessilibus vel ad 5 mm. longe pedunculatis, pedicellis gracilibus, 6-13 mm. longis, albido-villosulis; hypanthium 1.5 mm. longum, tomentellum; calyx 4-partitus, lobis triangulari-ovatis, acutis, 1.5-2 mm. longis, in statu fructifero saepe accrescentibus et ad 4 mm. longis, extus tomentellis; corolla rubra, extus subdense et brevissime villosa, tubo 8 mm. longo, 2 mm. lato, cylindrico, fauce glabro, lobis late ovatis, obtusis, 2 mm. longis; capsula didymo-globosa, 4 mm. longa, 5-6 mm. lata, villosula.—Peru: Mito, alt. 2,700 m., July, 1922, Macbride and Featherstone 1395 (Herb. Field Mus. No. 517,896, type). Tambillo, 7 miles southwest of Panao, alt. 2,400 m., May 8, 1923, Macbride 3571.

Among the 19 species of *Manettia* known from Peru, this is easy to recognize because of the dense yellowish glistening tomentum of the lower leaf surface.

Manettia modica Standl., sp. nov.—*Frutex scandens, caulis gracilibus, vetustioribus subteretibus, novellis sordide villosulis; stipulae brevissime vaginantes, truncatae, setis paucis subulatis 1-2 mm. longis onustae; petoli crassiusculi, puberuli, c. 2 mm. longi; limbus lanceolatus vel ovato-lanceolatus, 2-3.5 cm. longus, 0.6-1 cm. latus, longiacuminatus, basi obtusus, crassiusculus, utrinque pilis debilibus brevibus sparse villosus vel glabratus, supra viridis, costa impressa, subtus pallidus, costa et nervis elevatis, nervis lateralibus utroque latere 4-5, angulo acuto adscendentibus, margine revoluta; flores umbellati, umbellis paniculas breves angustas foliatas vel fere nudas efformantibus, breviter pedunculatis, pedicellis c. 6 mm. longis, superne incrassatis, minute puberulis; capsula clavato-obovoidea, 5 mm. longa, 3-4 mm. lata, apice rotundata, basi acuta et longe attenuata, sparse et minute puberula vel glabrata; calycis lobii 4, ad apicem capsulae persistentes, late ovati, acuti, glabri.*—Peru: Villcabamba, on Río Chinchao, alt. 1,800 m., July 17-26, 1923, J. Francis Macbride 5154 (Herb. Field Mus. No. 536,197, type).

Apparently this is an ally of the Peruvian *M. thysanophora* Wernh., but in that the leaves are described as elliptic, the petioles as 7-8 mm. long, and the calyx lobes as obtuse.

Manettia calycosa Griseb., var. *latifolia* Standl., var. nov.—*Folia petiolata, limbo rotundato-ovato, 5-5.5 cm. longo, 3.5-4 cm. lato, abrupte et acute acuminato, basi late rotundato; ceteris formae typicae similis.*—Colombia: Between Chinácota and La Esmeralda, Dept. Norte de Santander, alt. 1,000-1,300 m., March 19, 1927, E. P. Killip and Albert C. Smith 20855 (U. S. Nat. Herb. No. 1,355,819, type).

Except for its very broad leaves, this plant agrees with the numerous specimens of *M. calycosa* available for study. The flowers are more numerous and on somewhat longer pedicels than is usual in the species.

Manettia rivulorum Standl., sp. nov.—*Frutex scandens, caulis gracilibus, subteretibus, novellis breviter adpresso-pilosus; stipulae vix vaginantes, erectae, c. 1 mm. longae, rotundatae, laciniate-denticulatae; petiolus gracilis, 5-10 mm. longus, adpresso-pilosus; limbus ellipticus vel ovato-ellipticus, 4-5.5 cm. longus, 2-2.5 cm. latus, abrupte breviterque acuminatus, acumine acuto, basi acutus vel obtusus, membranaceus, supra viridis, minute adpresso-pilosulus, nervis inconspicuis, subtus pallidior, praesertim ad nervos sparse strigillosus, costa et nervis gracilibus, prominulis, nervis lateralibus utroque latere 5-6, angulo acuto adscendentibus, arcuatiss, margine plana; flores cymosi, cymis axillaribus, solitariis, umbelliformibus vel dichotomis, laxe paucifloris, foliis fere aequilongis, 6-12 mm. longe pedunculatis, bracteis plerumque lanceolatis et 2-3 mm. longis, pedicellis 5-12 mm. longis, sparse hirtellis; calyx 4-partitus, lobis ad apicem capsulae persistentibus, 2-2.5 mm. longis, ellipticis, acutis et*

apiculatis, ciliolatis, fere glabris; capsula globoso-obovoidea, 6-7 mm. longa, basi acuta, glabrata; semina compressa, fusca, lucida, 3 mm. longa, late alata.—Colombia: Dense woods along stream, Las Vegas, Dept. Santander, alt. 2,600-3,000 m., December 21-23, 1926, E. P. Killip and Albert C. Smith 16058 (U. S. Nat. Herb. No. 1,351,834, type).

The plant presents no outstanding characters, and because of the absence of corollas its affinities are uncertain, but it has not been possible to refer it satisfactorily to any of the species known from Colombia.

Manettia suratensis Standl., sp. nov.—Herba scandens, caulis gracilis, subteretibus, viridibus, sparse pilis debilibus patentibus albidis villosis, internodiis maxime elongatis; stipulae brevissime vaginantes, vix 1.5 mm. longae, subtruncatae, laciniato-dentatae; petiolus gracilis, 8-18 mm. longus, pilosus; limbus lanceolatus vel ovato-lanceolatus, 4.5-8 cm. longus, 1.5-3 cm. latus, longissime et anguste acuminatus, basi acutus vel abrupte contractus et longe decurrens, membranaceus, supra viridis, sparse et breviter adpresso-pilosulus, subtus paullo pallidior, pilis mollibus albidis sparse pilosus, costa et nervis gracillimis, prominulis, nervis lateralibus utroque latere 7-8, angulo acuto adscendentibus, arcuatis, nervulis inconspicuis, margine plana; flores axillares, solitarii vel fasciculati, pedicellis gracilibus, c. 7 mm. longis, pilis gracilibus multicellularibus villosis; hypanthium obovoideum, 2.5 mm. longum, basi obtusum, dense villosum; calyx fere ad basin 8-lobus, laciniis linearibus vel lanceolato-oblongis, 2-3 mm. longis, viridibus, acutis, recurvis, sparse villosis; corolla extus sparse pilis longis villosa, tubo viridi, 8 mm. longo, 2.2 mm. lato, fauce dense et longe barbato, lobis oblongo-ovatis, albis, patentibus, 5 mm. longis, obtusis, intus glabris.—Colombia: In thicket along river, Suratá, Dept. Santander, alt. 1,700 m., January 4-10, 1927, E. P. Killip and Albert C. Smith 16811 (U. S. Nat. Herb. No. 1,352,503, type).

Related, apparently, to *M. Pearcei* Wernh., of Colombia, but in that the corolla tube is 15 mm. long and merely puberulent, and the calyx lobes are 5 mm. long.

Manettia echitidea Standl., sp. nov.—Frutex scandens, caulis subteretibus, stramineis, glabratibus, novellis gracillimis, dense retrorsoscaperulis; stipulae erectae, brevissime vaginantes, rotundatae, laciniato-denticulatae; petioli 2-4 mm. longi, puberuli; limbus lanceolato-oblongus, 2.5-4.5 cm. longus, 0.8-1.5 cm. latus, subabrupte acuminatus, basi obtusus, crassiusculus, supra viridis, ad costam puberulus, nervis obsoletis, subtus ochraceus, ad costam puberulus vel fere omnino glaber, costa gracili, prominula, nervis occultis, margine plana; flores umbellato-cymosi vel in axillis, fasciculati, cymis paucifloris, breviter pedunculatis, bracteis foliaceis, lanceolatis, usque ad 7 mm. longis, pedicellis validis, 1-5.3 mm. longis, dense

puberulis; hypanthium obovoideum, 1.5 mm. longum, basi acutiusculum, dense puberulum; calyx ad basin 4-partitus, laciniis triangulatis, 1.5 mm. longis, acutis, crassis, glabratis; corolla extus glabra, tubo crasso, cylindrico, 3-4.5 mm. longo, 1.5 mm. lato, lobis oblongo-ovatis, 2 mm. longis, obtusis, intus dense breviterque villosis.—Colombia: La Japa, Tolima, alt. 1,000-1,400 m., March, F. C. Lehmann 7594 (Herb. Field Mus. No. 578,641, type).

André K1092 (N. Y.) from Río del Cristal may represent the same species, but the specimen is so imperfect that its determination is uncertain. *M. echitidea* is related to *M. corticifer* Wernh., but that differs in its thicker, strongly revolute leaves and glabrous hypanthium.

Hillia Macbridei Standl., sp. nov.—Frutex epiphyticus glaber, ramis subteretibus vel obtuse tetragonis, fusco-brunneis vel ochraceis, minute papillosis, internodiis 1-2.3 cm. longis; stipulae caducae, lanceolatae vel linear-lanceolatae, 1.5-2 cm. longae, versus apicem obtusum angustatae, tenuiter membranaceae; folia opposita, petiolo 3-5 longo, supra anguste sulcato; limbus lanceolatus, 2-3 cm. longus, 6-8 mm. latus, versus apicem obtusiusculum sensim angustatus, basi acutus, coriaceus, supra nitidus, costa impressa, nervis obsoletis, subtus opacus, albido-puncticulatus, costa valida, elevata, nervis obsoletis, margine revoluta; flores terminales, solitarii, sessiles; calyx ad apicem capsulae persistens, 5-partitus, lobis oblongo-ovatis, obtusis, 5 mm. longis, erectis; capsula anguste clavata, 5.5-6.5 cm. longa, medio 1 cm. lata, brunnea, inconspicue costata, versus basin longe sensimque angustata, versus apicem paullo angustata; semina numerosa, obovoidea, 1.5 mm. longa, basi abrupte filiformi-producta, apice coma e pilis c. 1.5 cm. longis cinnamomeis composita onusta.—Peru: La Merced, alt. 1,200 m., August-September, 1923, J. Francis Macbride 5760 (Herb. Field Mus. No. 536,790, type). Chinchamayo Valley, Dept. Junín, alt. 1,500 m., Schunke 436.

By its small, narrow leaves this is easily distinguished from all the species of *Hillia* known from western South America.

Isertia Weberbaueri Standl., sp. nov.—Ramuli 8 mm. crassi, obtuse tetragoni, obscure tomentelli vel fere glabri; stipulae 7 mm. longae, fere ad basin bifidae, lobis obtusis, glabratae; folia opposita, petiolo crasso, 4.5-5 cm. longo, supra plano vel bisulcato, fere glabro; limbus ovalis vel late ellipticus, 19-28 cm. longus, 10-14 cm. latus, apice rotundatus et abrupte breviterque acuminatus, acumine triangulari, acutiusculo, c. 2 cm. longo, basi rotundatus vel acutus, plerumque abrupte breviterque decurrens, crasse membranaceus, supra viridis, glaber, nervis non elevatis, subtus albidus, densissime et minute nisi secus nervos albido-tomentosus, costa valida, elevata, nervis lateralibus utroque latere c. 24, elevatis, gracilibus, angulo lato vel fere recto divergentibus, fere rectis, juxta marginem conjunctis, nervulis prominulis, reticulatis; panicula sessilis, dense mul-

tiflora, c. 26 cm. longa et 9 cm. lata, ramulis compresso-angulatis, sparse puberulis, floribus sessilibus vel 1-4 mm. longe pedicellatis; bracteae latae, minutae, rotundatae vel obtusae; calyx hypanthio adjecto campanulatus, 5-6 mm. longus, glaber, obscure lobulatus, lobulis truncatis; corollae tubus 27 mm. longus, gracilis, teres, basi 2.5 mm. latus, superne sensim ampliatus, fauce 5 mm. latus, extus dense fulvo-puberulus, lobis ovalibus, 5-6 mm. longis, apice obtusis vel rotundatis, glabris, fauce dense barbato; antherae oblongae, acutae, 5 mm. longae, apicibus e corolla vix exsertis.—Peru: Valley of the Río Mixiollo, Prov. Pataz, Dept. Libertad, alt. 1,400 m., August, 1914, A. Weberbauer 7054 (Herb. Field Mus. No. 548,998, type.)

Isertia Weberbaueri is related to *I. hypoleuca* Benth., but in the latter the calyx is larger and more conspicuously lobed, and the corolla is 5-8 cm. long.

Isertia parvifolia Standl., sp. nov.—Ramuli validi, 4-5 mm. crassi, obtuse tetragoni, striato-costati, dense puberuli, internodiis 1-2 cm. longis; stipulae 5-7 mm. longae, bipartitae, erectae, rigidiae, persistentes, lobis oblongo-lanceolatis, subulato-attenuatis, puberulis; folia opposita, petiolo 2-2.5 cm. longo, gracili, supra plano, puberulo; limbus oblongus vel anguste elliptico-oblongus, 12-20 cm. longus, 4-6 cm. latus, longiacuminatus, acumine angusto, obtuso, basi acutus vel acuminatus, interdum abrupte contractus et decurrentis, subcoriaceus, supra obscure viridis, lucidus, glaber vel ad costam paullo elevatam minute puberulus, nervis et nervulis subimpressis, subtus albidus, densissime et minute cinereo-tomentosus, costa valida, elevata, nervis lateralibus utroque latere c. 20, angulo lato adscendentibus, gracillimis, elevatis, fere rectis, juxta marginem arcuato-conjunctis, nervulis conspicuis, arcte reticulatis, margine revoluta; panicula sessilis vel breviter pedunculata, sublaxe pauci- vel multiflora, 5-7 cm. longa, c. 5 cm. lata, ramulis angulatis, dense griseo-puberulis; bracteae late triangulares, 1.5-2 mm. longae, acutae, persistentes, puberulæ; flores sessiles vel 2-4 mm. longe pedicellati; calyx hypanthio adjecto 5-6 mm. longus, anguste campanulatus, brevissime lobulatus, lobulis late rotundatis, ciliolatis, glaber, basi obtusus; corollae tubus 22 mm. longus, basi 1.5 mm. latus, superne paullo ampliatus, fauce 3 mm. latus, griseo-puberulus, fauce dense villosus, lobis ovalibus, 6-7 mm. longis, obtusis, glabris; antherae lineares, 4.5 mm. longae, acuminate, vix exsertae; stylus gracilis, glaber, tubo corollae aequilongus.—Peru: Chanchamayo Valley, Dept. Junín, alt. 1,500 m., April, 1924-27, Carlos Schunke 393 (Herb. Field Mus. No. 571,447, type).

This species is a relative of *I. Weberbaueri*, but it differs conspicuously from that in the small narrow long-acuminate leaves and much-reduced inflorescence.

Gonzalagunia Killipii Standl., sp. nov.—Frutex, ramulis graciliibus, teretibus, ferrugineo-brunneis, novellis pilis brevibus griseis

dense strigosis, serius glabratis, internodiis elongatis; stipulae 5-6 mm. longae, erectae, persistentes, e basi triangulari linearci-caudatae, glabratae; petioli crassi, strigosi, 2-4 mm. longi; limbus ovatus vel oblongo-ovatus, 8.5-11 cm. longus, 4-5 cm. latus, longiacuminatus, basi rotundatus, subcoriaceus, supra laete viridis, scaberulus vel glabratius, sublucidus, arcte bullatus, nervis et nervulis profunde impressis, subtus densissime albido-tomentosus, ad nervos strigosus, costa et nervis gracilibus, elevatis, nervis lateralibus utroque latere c. 14, adscendentibus, arcuatis, marginem fere attingentibus, margine anguste revoluta; paniculae spiciformes, breviter pedunculatae, 15-28 cm. longae, florum fasciculis remotis, paucifloris, rhachi gracili, rigida, pilis brevibus rigidis adscendentibus dense induita, pedicellis usque ad 2 mm. longis vel fere nullis, strigillosum, bracteis linearibus, ad 3 mm. longis; hypanthium subglobosum, 1.5 mm. longum, dense strigillosum; calyx vix 1 mm. longus, glaber, breviter 4-dentatus, dentibus late triangularibus, acutiusculis; corolla alba, 5-6.5 mm. longa, extus sparse strigosa, tubo superne paullo dilatato, fauce 1.5 mm. lato; fructus albus, depresso-globosus, 5 mm. latus, fere glaber. —Colombia: La Gallera, Micay Valley, Cordillera Occidental, El Cauca, alt. 1,100-1,300 m., June 29-30, 1922, Ellsworth P. Killip 7823 (U. S. Nat. Herb. No. 1,140,628, type; duplicate in herb. N. Y. Bot. Gard.).

In general appearance this resembles closely *G. dependens* R. & P., which grows in Colombia, but the latter is distinguished by the densely tomentose inflorescence.

Perhaps there should be referred here *Lehmann B.T.614*, without locality, but the specimen, although agreeing in pubescence, differs in its thin, not rugose, practically sessile leaves. The material available is not in good enough condition to make possible a definite decision.

Gonzalagunia discolor Standl., sp. nov.—Frutex, ramulis gracilibus, rigidis, teretibus, brunnescentibus, novellis strigosis vel scaberulis, internodiis brevibus vel elongatis; stipulae 3-4 mm. longae, persistentes, erectae, rigidae, e basi triangulari subulato-acuminatae, scaberulace; folia opposita, petiolo crassiusculo, 2.5-7 mm. longo, scaberulo vel strigilloso; limbus ovatus vel ovato-ellipticus, 1.5-3.3 cm. longus, 0.7-1.5 cm. latus, acutus vel abrupte breviterque acuminatus, acumine triangulari, obtuso, basi obtusus vel subrotundatus, subcoriaceus, supra viridis, sicco nigrescens, glaber, nervis subimpressis, subtus ochraceus, tantum ad nervos et costam strigillosum vel scaberulus vel fere glaber, costa et nervis crassis, elevatis vel planis, nervis lateralibus utroque latere 5-6, angulo acuto adscendentibus, arcuatis, prope marginem conjunctis; paniculae spiciformes, terminales, breviter pedunculatae, 1-3 cm. longae, pauci-florae, rhachi scaberula vel breviter hirtella, bracteis oblongis vel lanceolatis, 1-1.5 mm. longis; hypanthium subglobosum, scaberulum; calyx 4-lobatus, vix 1 mm. longus, lobis rotundato-ovalis, obtusis-

simis, subpatentibus, glabratibus; fructus 4-coccus, purpureo-ruber, 3.5 mm. latus, glabratus.—Colombia: La Gallera, Micay Valley, Cordillera Occidental, Dept. El Cauca, alt. 2,000-2,200 m., July 1, 1922, Ellsworth P. Killip 7959 (U. S. Nat. Herb. No. 1,140,961, type; duplicate in herb. N. Y. Bot. Gard.).

This species is well marked by the small, thick, nearly glabrous leaves, conspicuously paler beneath, with few coarse lateral nerves, and by the reduced inflorescence.

Gonzalagunia flexuosa Standl., sp. nov.—Arbor, ramulis gracilis, teretibus, ferrugineo-brunneis, dense strigosis vel serius glabratibus, internodiis elongatis; stipulae anguste triangulares, 7-8 mm. longae, subulato-attenuatae, brunneae, extus strigosae, persistentes; folia opposita, petiolo 10-13 mm. longo, dense strigoso; limbus ovato-oblongus vel anguste ovatus, 10.5-15.5 cm. longus, 4-6 cm. latus, abrupte longiacuminatus, acumine angusto, falcato, membranaceus, supra viridis, pilis brevibus sparse strigosus vel glabratibus, costa et nervis prominulis, subtus paullo pallidior, griseus, pilis gracillimis alibidis patentibus pilosus, ad nervos strigosus, costa et nervis gracillimis, prominulis, nervis lateralibus utroque latere c. 10, angulo acuto adscendentibus, arcuatis; paniculae terminales, pedunculatae, 22-50 cm. longae, c. 2 cm. latae, florum fasciculis paucifloris, remotis, rhachi gracili, flexuosa, dense strigosa, pedicellis gracilibus, plerumque 3-7 mm. longis, strigosis, bracteis lineariformibus, pedicellis aequilongis vel brevioribus; hypanthium subglobosum, 1.5 mm. longum, setuloso-strigosum; calyx fere ad basin 4-fidus, lobis inaequalibus, 1-2 mm. longis, patentibus, oblongo-linearibus, basi dilatatis, obtusis, glabratibus; corolla alba, 6-8 mm. longa, sparse strigosa, tubo 1 mm. crasso, fauce paullo ampliato; fructus immaturus 4-coccus, 2.5 mm. diam., dense strigosus.—Colombia: La Gallera, Micay Valley, Dept. El Cauca, alt. 1,400-1,500 m., June 29-30, 1922, Ellsworth P. Killip 7696 (U. S. Nat. Herb. No. 1,140,621, type).—Ecuador: Valley of Pastaza River, between Baños and Cashurco, Prov. Tungurahua, alt. 1,300-1,800 m., September 25, 1923, A. S. Hitchcock 21,803 (Herb. N. Y. Bot. Gard.).

Evidently related to *G. rufa* Standl., of Panama and Colombia, but that species differs in its shorter corolla, nearly sessile leaves, and very short pedicels. The Ecuador specimen differs from the type in having shorter petioles and a slightly larger corolla, but otherwise it seems to agree in all essential characters.

Gonzalagunia Whitei (Rusby) Standl., comb. nov. *Duggena Whitei* Rusby, Mem. N. Y. Bot. Gard. 7: 371. 1927.

Gonzalagunia asperula (Wernh.) Standl., comb. nov. *Gonzalea asperula* Wernh. Journ. Bot. 51: 219. 1913.

Gonzalagunia cornifolia (HBK.) Standl., comb. nov. *Gonzalea cornifolia* HBK. Nov. Gen. & Sp. 3: 416. 1819.

Coccocypselum pleuropodium (Donn. Smith) Standl., comb. nov. *Geophila pleuropoda* Donn. Smith, Bot. Gaz. 52: 50. 1911. *Tontanea pleuropoda* Standl. N. Amer. Fl. 32: 148. 1921.

Coccocypselum hispidulum Standl., comb. nov. *Tontanea hispidula* Standl. N. Amer. Fl. 32: 147. 1921.

Hoffmannia verticillata (Ruiz & Pav.) Standl., comb. nov. *Ohigginsia verticillata* Ruiz & Pav. Fl. Peruv. 1: 55. pl. 85, f. a. 1798. *Higginsia verticillata* Pers. Syn. Pl. 1: 133. 1805.

Hoffmannia obovata (Ruiz & Pav.) Standl., comb. nov. *Ohigginsia obovata* Ruiz & Pav. Fl. Peruv. 1: 55. pl. 85, f. b. 1798. *Higginsia obovata* Pers. Syn. Pl. 1: 133. 1805.

Hoffmannia triosteoides Standl., sp. nov.—Frutex 0.6-1.8 m. altus, interdum debilis, ramis saepe elongatis, crassis, obtuse tetragonis, griseis vel ochraceis, novellis dense villosis, internodiis brevibus vel elongatis; stipulae deciduae; folia opposita, petiolo 0.5-3.5 cm. longo, interdum fere ad basin marginato, villosa; limbus ellipticus, elliptico-obovatus, vel rarius oblongo-obovatus, 5-19 cm. longus, 2.5-6.5 cm. latus, abrupte acuminatus, acumine angusto, obtuso, interdum acutus, basi abrupte acuminatus et plerumque longe decurrens, rarius sensim attenuatus, membranaceus, supra viridis, sparse pilis longis patentibus villosus, minute albido-puncticulatus, subtus pallidior, undique sed ad nervos densius pilis pallide ferruginea pilosus, costa valida, paullo elevata, nervis lateralibus utroque latere c. 9, angulo lato vel acuto divergentibus, arcuatis, gracilibus, juxta marginem conjunctis; cymae subsessiles, dense pauci- vel multiflorae, in axillis solitariae vel fasciculatae, petiolis breviores, pedicellis ad 2 mm. longis; calycis lobi lineares, 1.5-2(-6) mm. longi, villosuli; corolla alba, in alabastro acutiuscula, extus sparse villosa, tubo 1.8 mm. longo, superne dilatato, lobis lanceolato-oblongis, 6 mm. longis, ad apicem attenuatis; bacca rubra, ovalis, 5-7 mm. longa, 4-6 mm. lata, sparse villosa; semina numerosissima, minuta, profunde foveolata.—Colombia: Western slope of Peña Blanca, near Charta, Dept. Santander, in dense woods, alt. 2,500 m., E. P. Killip and Albert C. Smith 19,265 (U. S. Nat. Herb. No. 1,354,542, type). Charta, alt. 2,000-2,600 m., Killip and Smith 19,314, 17,449, 19,015. Southern slope of Mt. San Martín, near Charta, alt. 2,300-2,500 m., Killip and Smith 19,147, 19,141. Between Piedecuesta and Las Vegas, Santander, alt. 2,000-2,500 m., Killip and Smith 21,141. Loso, Norte de Santander, alt. 2,200-2,400 m., Killip and Smith 20,434. California, Santander, alt. 2,200 m., Killip and Smith 17,092. Río Suratá Valley, above Suratá, Santander, alt. 2,000-2,300 m., Killip and Smith 16,597. (Specimens all in U. S. Nat. Herb.).

This species, so well illustrated by such ample and well-prepared material, which is remarkably uniform, is distinguished by the copious villous pubescence, compact inflorescences, and long narrow calyx lobes.

Hoffmannia pauciflora Standl., sp. nov.—*Frutex gracilis* 1-2.5 m. altus, ramulis gracilibus, teretibus, brunneis vel fuscis, glabris, novellis praesertim ad nodos villosulis vel puberulis, internodiis 1.5-4.5 cm. longis; stipulae caducae; folia opposita, petiolo gracili, 0.8-5.5 cm. longo, sparse ferrugineo-puberulo vel glabrato; limbus oblongo-ellipticus, elliptico-obovatus, vel oblanceolato-oblongus, 8-13.5 cm. longus, 3.5-5.5 cm. latus, abrupte breviterque acuminatus, acumine anguste triangulari, acutiusculo, basi abrupte vel sensim acuminatus et plus minusve decurrentis, membranaceus, supra viridis, glaber, raphidibus brevibus pallidis satis dense conspersus, nervis inconspicuis, subtus pallidior, ad nervos sparse et minute villosulus, costa crassiuscula, paullo elevata, nervis lateralibus utroque latere c. 10, gracilibus, angulo lato divergentibus, valde arcuatiss, prope marginem conjunctis; cymae axillares, solitariae vel fasciculatae, 3-7-florae, umbelliformes, 5-15 mm. longe pedunculatae, petiolis breviores, pedicellis gracilis, 2-7 mm. longis, glabris vel obscure villosulis; hypanthium oblongum, 2-3 mm. longum, basi acutiusculum, glabrum; calyx vix 1 mm. longus, lobis late triangularibus, acutiusculis, ciliolatis; corolla albescens, in alabastro acutiuscula, glabra vel pilis paucis brevissimis induta, tubo 2 mm. longo, lobis oblongis, 4-4.5 mm. longis, acutiusculis, intus tomentellis; antherae subexsertae, 3 mm. longae, acutae; bacca oblonga, 4-7 mm. longa, 3 mm. lata, glabra.—Colombia: In damp forest, usually near water, near Valparaíso, region of Santa Marta, alt. 1,050-1,500 m., March 3, 1898-99, H. H. Smith 1814 (Herb. Field Mus. No. 138,663, type; duplicate in herb. N. Y. Bot. Gard.). Without locality, Moritz 843 (U. S. Nat. Herb.).

Hoffmannia asperula Standl., sp. nov.—*Frutex, ramulis gracilibus, subteretibus, glabratiss, novellis minute et sparse villosulis, internodiis 2-5.5 cm. longis; stipulae caducae; folia opposita, petiolo gracili, 1.5-2 cm. longo, minute villosulo vel puberulo; limbus oblongo-oblanceolatus, 15-21 cm. longus, 5-6 cm. latus, longiacuminatus, basin versus longe sensimque attenuatus, crassus, supra viridis, glaber, nervis inconspicuis, subtus pallidior, undique asperulo-puberulus, ad nervos villosulo-tomentellus, costa crassa, elevata, nervis lateralibus utroque latere c. 11, angulo lato divergentibus, gracilibus, elevatis, valde arcuatiss, prope marginem conjunctis; cymae axillares, fasciculatae, dense pauci- vel multiflorae, 4-8 mm. longe pedunculatae, petiolis breviores, pedicellis usque ad 2 mm. longis, puberulis; hypanthium turbinatum, 2 mm. longum, scaberulum; calyx 1 mm. longus, lobis triangularibus, acutiusculis, minutissime puberulis, erectis; corolla rubro-lutea, extus sparse puberula, in alabastro oblonga, obtusa, tubo 3 mm. longo, superne paullo ampliato, lobis*

oblongis, obtusis, 2 mm. longis, intus glabris; antherae oblongae, mucronatae, 3 mm. longae.—Colombia: San Antonio, above Cali, Dept. El Cauca, alt. 1,900 m., December, 1905, *H. Pittier* 767 (U. S. Nat. Herb. No. 530,958, type).

Easily recognized by the fine rough pubescence of the under surface of the leaves. Apparently conspecific is *Toro* 1137 (herb. N. Y. Bot. Gard.) from Dauro, near Medellín. In this the corolla is slightly larger and the inflorescence longer and more lax.

Hoffmannia dichroantha Standl., sp. nov.—Frutex, ramulis gracilibus, subteretibus, glabris, novellis bifariam ferrugineo-puberulis, internodiis 0.5-3 cm. longis; stipulae caducae, triangulares, acutae, puberulae, 1.5 mm. longae; folia opposita, petiolo gracili, 4-8 mm. longo, minute ferrugineo-puberulo; limbus oblongo-lanceolatus vel oblongo-oblaceolatus, 6-9.5 cm. longus, 1.5-2.5 cm. latus, longe acuminatus, acumine angusto, saepe falcato, obtuso, basin versus sensim angustatus vel abrupte acuminatus, longe decurrentes, membranaceus, supra viridis, raphidibus pallidis brevissimis sparse conspersus, nervis inconspicuis, subtus pallidior, ad nervos minute adpresso-puberulus, undique dense pallido-puncticulatus, costa et nervis gracilibus, prominulis, nervis lateralibus utroque latere c. 8, angulo lato adscendentibus, valde arcuatis, juxta marginem conjunctis; cymae in axillis solitariae vel fasciculatae, laxe pauciflorae, subsessiles vel usque ad 4 mm. longe pedunculatae, pedicellis 1-2 mm. longis, minute puberulis; calyx vix 1 mm. longus, lobis ovato-triangularibus, obtusis, ciliolatis; corolla rubra, lobis ad apicem luteis, extus glabra, in alabastro acuta, 3 mm. longa.—Colombia: In forest below Cascada Chorrón, south of Antizales, Dept. Bolívar, alt. 1,700-2,000 m., February 25, 1918, *Francis W. Pennell* 4418 (Herb. N. Y. Bot. Gard., type).

From *H. asperula* this differs in its small leaves, small corolla, and acute buds.

Hoffmannia glabra Standl., sp. nov.—Frutex 1-1.5 m. altus, ramis crassis, teretibus, glabris, viridibus, internodiis plerumque elongatis; stipulae triangulares, acutae, 2 mm. longae, deciduae; folia opposita, petiolo gracili, 1-4.5 cm. longo, glabro; limbus ellipticus vel oblongo-ellipticus, 8-19 cm. longus, 3.5-8 cm. latus, sensim vel abrupte longiacuminatus, acumine angusto, saepe falcato, longi-attenuato, basi acutus vel abrupte acuminatus, plus minusve decurrentes, membranaceus, glaber, saepe utrinque raphidibus minutis albidis dense conspersus, supra viridis, nervis inconspicuis, subtus pallidior, costa crassiuscula, prominente, nervis lateralibus utroque latere 9-12, angulo lato adscendentibus, valde arcuatis, gracilibus, juxta marginem conjunctis; cymae in axillis solitariae vel fasciculatae, dense multiflorae, petiolo aequilongae vel breviores, sessiles vel usque ad 2.5 cm. longe pedunculatae, pedicellis 1-5 mm. longis, minute et sparse puberulis vel glabris; hypanthium 2-2.5 mm.

longum, turbinatum vel oblongum, basi acutum vel obtusum, glabrum; calyx 1 mm. longus, lobis triangularibus, acutis, erectis, plerumque ciliolatis; corolla pallide lutea, glabra, in alabastro obtusa, tubo 4 mm. longo, supra paullo ampliato, lobis oblongis vel ovalibus, 3 mm. longis, obtusis; antherae semiexsertae, obtusae; bacca oblonga, 8 mm. longa, 3-5 mm. lata, basi obtusa, glabra, nigra vel vinacea, 4-locularis; semina numerosissima, minuta, brunnea, foveolata.—Colombia: Valley of Charta, Santander, alt. 2,000 m., February 1-11, 1927, E. P. Killip and Albert C. Smith 19,034 (U. S. Nat. Herb. No. 1,354,339, type). Charta, alt. 2,600 m., Killip and Smith 19,005 (U. S.). Loso, Norte de Santander, alt. 2,200-2,400 m., Killip and Smith 20,405 (U. S.). Southern slope of Mt. San Martín, Santander, alt. 2,300-2,500 m., Killip and Smith 19,139 (U. S.). Above Fusagasugá, Cundinamarca, alt. 1,800-2,300 m., Pennell 2707 (N. Y.).

Among the Colombian species this plant is easy to detect because of the fact that it is almost wholly glabrous.

Hoffmannia Killipii Standl., sp. nov.—Arbor, ramulis teretibus, usque ad 1.5 cm. crassis, fuscis, glabris; folia opposita, petiolo 5.5-8.5 cm. longo, crassiusculo, glabro; limbus ellipticus, c. 25 cm. longus et 10-12 cm. latus, basi acutus, crasse membranaceus, glaber, supra viridis, nervis inconspicuis, subtus pallidior, minute pallido-puncticulatus, costa crassa, elevata, nervis lateralibus utroque latere c. 13, angulo fere recto divergentibus, arcuatis, juxta marginem conjunctis, nervulis conspicuis; cymae in axillis vel ad nodos defoliatos solitariae vel fasciculatae, laxe multiflorae, petiolis aequilongae vel breviores, 2-3.5 cm. longae, pedunculatae, pedunculo gracili, glabro, pedicellis gracilibus, 6-8 mm. longis; calyx 0.7 mm. longus, brevisime lobatus, lobulis late rotundatis; bacca globoso-ovalis, 4-5 mm. longa, 4 mm. lata, basi rotundata vel obtusa, glabra, 2-locularis.—Colombia: Dense forest, Río Santa Rita, Salento, Dept. Caldas, alt. 1,600-1,800 m., July 29, 1922, Ellsworth P. Killip and Tracy E. Hazen 8986 (Herb. N. Y. Bot. Gard., type).

Near *H. glabra*, but distinguished by the large lax inflorescence, long pedicels, and small fruit.

Hoffmannia coronata Standl., sp. nov.—Rami graciles, subteretes, novellis dense pilis ferrugineis adpressis pilosis, internodiis 1.5-5.5 cm. longis; stipulae late triangulares, obtusae, puberulae, 1-1.5 mm. longae, deciduae; folia opposita, petiolis gracilibus, 5-9 mm. longis, dense ferrugineo-puberulis; limbus oblongo-ellipticus vel oblongo-ovatus, 6-9 cm. longus, 2-3.5 cm. latus, abrupte acuminatus vel longiacuminatus, acumine saepe falcato, acuto, basin versus longe sensimque attenuatus, membranaceus, supra viridis, glaber, raphidibus minutis pallidis conspersus, nervis inconspicuis, subtus pallidior, undique sparse, ad nervos dense, pilis minutis incurvo-puberulus, costa gracili, elevata, nervis lateralibus utroque latere c. 9,

gracilibus, angulo lato adscendentibus, arcuatis, prope marginem conjunctis; cymae axillares, solitariae, 2-3-florae, 1.7-4 cm. longe pedunculatae, pedunculo gracili, dense incurvo-puberulo, pedicellis 1-2.5 mm. longis, hypanthium oblongum, 2.5 mm. longum, dense puberulum vel pilosulum, basi obtusum; calyx lobis lineares, ciliati, subaequales, 2-3 mm. longi; corolla in alabastro oblongo-ovoidea, acuta, sparse villosula, tubo 1 mm. longo, lobis ovato-oblongis, 5 mm. longis, acutis; antherae exsertae, lineari-oblongae, obtusae, 2.2 mm. longae; bacca ovalis, 6 mm. longa, 4 mm. lata, basi obtusa vel rotundata, sparse puberula; semina numerosa, minuta, brunnea, foveolata.—Colombia: Tamesis, vicinity of Medellín, February 1, 1928, *Rafael A. Toro* 974 (Herb. N. Y. Bot. Gard., type).

In its general aspect and narrow calyx lobes this plant suggests *H. triosteoides*, but that species differs in its villous pubescence and dense congested inflorescence.

Hoffmannia vesciculifera Standl., sp. nov.—Suffruticosa, subrecta, simplex, caule c. 10 cm. alto, 4 mm. crasso, tereti, dense pilis longis patentibus brunnescensibus multicellularibus villoso, apice dense foliato, internodiis brevibus; stipulae caducae; petioli in parte inferiore nuda 7-11 mm. longi, crassi, dense longivillosi, in parte superiore vesciculiferi, vesciculo inflato, basin limbi attingente, 1-2.3 cm. longo, 5-8 mm. lato, apice paullo supra insertionem utrinque producto, lobis rotundatis, basi obtuso vel paullo angustato, viridi, dense viloso; limbus obovato-ellipticus vel ovali-ellipticus, 9-16.5 cm. longus, 5-8 cm. latus, apice breviter acuminatus vel subrotundatus et brevissime latiacuminatus, acumine acuto, basi obtusus vel rotundatus, membranaceus, supra viridis, sparse pilis longis villosus, nervis inconspicuis, subtus pallidior, ad nervos dense pilis longis mollibus multicellularibus fulvis villosus, costa crassa, elevata, nervis lateralibus utroque latere c. 10, crassiusculis, angulo acuto adscendentibus, arcuatis, percurrentibus, nervulis prominulis, reticulatis; flores cymosi, cymis axillaris, longipedunculatis, cum pedunculo 4-7 cm. longis, laxe multifloris, dense longivillosis, pedunculo gracili, 1.5-3.5 cm. longis, ramulis secundifloris, pedicellis 4-7 mm. longis; hypanthium obovoideum, 2.5 mm. longum, villosum; calyx 4-partitus, pilis longis patentibus multicellularibus villosus; bacca rubra, obovoideo-globosa, 5 mm. longa, dense villosa; semina numerosa, globoso-obovoidea, 0.4 mm. longa, pallide brunnea, foveolata.—Panama: Buena Vista Camp on Chiriquí Trail, alt. 750 m., 1928, *G. P. Cooper* 231 (Herb. Field Mus. No. 579,284, type), 225.

The material of this plant available for study is not as ample or in as good condition as one would wish, but the habit and fruit characters indicate that it is closer to *Hoffmannia* than to any other American genus of Rubiaceae. The inflated vesicles of the petioles, closely resembling those of certain melastomes, are unique. It is probable that flowers, when they are available, will supply characters

to justify the separation of this remarkable plant as a distinct generic type, but the incompleteness of the present material does not warrant such a treatment on the sole basis of the vesicles.

Schradera exotica (Gmel.) Standl., comb. nov. *Urceolaria exotica* Gmel. Syst. Nat. 2: 390. 1791. *S. capitata* Vahl, Eclog. 1: 35. 1796.

Schradera acuminata Standl., sp. nov.—Arbor omnino glabra, ramulis crassis, obtuse tetragonis, rimosis, ochraceis, internodiis 1-5.5 cm. longis, nodis incrassatis; stipulae deciduae, non visae; folia opposita, petiolo crasso, 9-13 mm. longo; limbus ellipticus vel ovali-ellipticus, 6.5-8.5 cm. longus, 2.7-4 cm. latus, apice abrupte breviterque acuminatus, acumine c. 5 mm. longo, triangulari, obtuso, basi obtusus vel subrotundatus et plerumque abrupte breviterque contractus, opacus, subcoriaceus, supra viridis, nervis non elevatis, inconspicuis, subtus brunnescens, costa valida, elevata, nervis lateralibus utroque latere c. 12, angulo acuto adscendentibus, fere rectis, gracillimus, prominulis, prope marginem nervum collectivum irregularē efformantibus, margine plana; flores capitati, capitibus terminalibus, solitariis, c. 4-floris, pedunculo 5 mm. longo, 4 mm. crasso, involucro campanulato, 1-7 cm. longo, c. 2 cm. lato, breviter et inaequaliter lobato; hypanthium 5 mm. longum et 7 mm. latum; calyx late tubulosus, 7 mm. longus, limbo brevissime et irregulariter lobato; semina (immatura) orbicularia, compressa, 1-1.2 mm. lata.—Colombia: In forest, La Cumbre, Cordillera Occidental, Dept. El Valle, alt. 1,800-2,000 m., May 7-10, 1922, F. W. Pennell 5146 (U. S. Nat. Herb. No. 1,140,563, type).

A relative of *S. exotica* (Gmel.) Standl., of the West Indies, but that species differs in its obtuse or rounded leaves, long peduncles, and shorter involucre.

Schradera cacuminis Standl., sp. nov.—Arbor glabra, ramulis 5-6 mm. crassis, subteretibus, ochraceis, internodiis 2-3 cm. longis, nodis incrassatis; folia opposita, petiolo crassiusculo, 6-15 mm. longo, basi incrassato; stipulae non visae; limbus anguste elliptico-oblongus, 8.5-10.5 cm. longus, 2.5-3.5 cm. latus, sensim vel abrupte longiacuminatus, acumine acutiusculo, basi acutus, coriaceus, sublucidus, supra viridis, costa non elevata, nervis obscuris, subtus fusco-brunnescens, costa gracili, elevata, nervis lateralibus utroque latere c. 14, angulo acuto adscendentibus, fere rectis, prope marginem nervum collectivum irregularē efformantibus, margine anguste revoluta; flores capitati, capitibus terminalibus, solitariis, c. 8-floris, pedunculo c. 1 cm. longo et 5 mm. crasso, involucro cyathiformi, 1.8 cm. longo, 2.5 cm. lato, breviter irregulariterque lobato; hypanthium 5 mm. longum et latum, calyx tubuloso, 9 mm. longo, superne 7 mm. lato, truncato vel obscure lobato; corolla alba, tubo 10-12 mm. longo, fauce 2.5 mm. lato, intus villosa, lobis 5, obovato-oblongis, 5 mm. longis; antherae lineares, 4.5 mm. longae.—Colombia: Bushy sum-

mit of west peak, La Cumbre, Cordillera Occidental, Dept. El Valle, alt. 2,100-2,400 m., September, 1922, Ellsworth P. Killip 11369 (U. S. Nat. Herb. No. 1,140,710, type).

From *S. acuminata*, of the same region, this differs in the narrow, long-acuminate leaves, acute at base, and in the long peduncles.

Schradera revoluta Standl., sp. nov.—Arbor glabra, ramulis 3-5 mm. crassis, obtuse tetragonis, ochraceis, internodiis 7-18 mm. longis, nodis incrassatis; stipulae late ovatae, 8 mm. longae, obtusae, basi connatae, brunneae, caducae; folia opposita, petiolo crasso, 3-5 mm. longo; limbus lanceolato-oblongus vel anguste elliptico-oblongus, 4-6.5 cm. longus, 1.3-2.2 cm. latus, apicem versus paullo angustatus, obtusus vel acutiusculus, basi obtusus, crasse coriaceus, supra viridis, lucidus, costa non elevata, nervis obsoletis subtus fusco-brunnescens, costa gracili, prominente, nervis lateralibus utroque latere c. 10, obscuris, angulo acuto adscendentibus, margine valde revoluta; flores capitati, capitibus terminalibus, solitarii, c. 5-floris, pedunculo 3-5 mm. longo et crasso, involucro late cyathiformi, 7-8 mm. longo, 1.5-2 cm. lato, integro vel irregulariter breviterque lobato; hypanthium 5 mm. longum et latum, calyce late tubuloso, 6 mm. longo, integro vel breviter fisso; corolla alba, tubo 1 cm. longo, superne sensim ampliato, fauce 4 mm. lato, intus glabro, lobis 5, oblongis, 7 mm. longis, acutiusculis; antherae lineares, 4 mm. longae; stylus 10 mm. longus, crassiusculus, glaber, lobis oblongis, 2 mm. longis.—Colombia: In forest, La Gallera, Micay Valley, Dept. El Cauca, alt. 2,200-2,500 m., July 1, 1922, Ellsworth P. Killip 7971 (U. S. Nat. Herb. No. 1,140,635, type).

From both the other new species here described this is distinguished by its small, narrow, short-petiolate leaves with strongly revolute margins. From *S. cacuminis* it differs also in the short peduncles and involucres, and in the glabrous corolla tube.

Alibertia Steinbachii Standl., sp. nov.—Frutex 2-3-metralis, ramulis gracilibus, teretibus, ochraceis, rimosis, novellis compressiusculis, minute puberulis, internodiis 1-4 cm. longis; stipulae triangulares, acutae, 2 mm. longae, erectae, persistentes; folia opposita, petiolis gracilibus, 3-5 mm. longis, supra late sulcatis vel planis, puberulis; limbus ellipticus, late ellipticus vel oblongo-obovatus, 2.5-4.5 cm. longus, 1.3-3 cm. latus, apice abrupte breviterque acuminate, acumine obtuso, rarius obtusus, basi acutus vel obtusus, membranaceus, supra viridis, glaber, costa et nervis gracilibus, prominentibus, nervulis interdum prominulis et reticulatis, subtus pallidior, ad costam puberulus atque sparse et brevissime barbatus, costa et nervis prominentibus, nervis lateralibus utroque latere 6-7, angulo lato abeuntibus, inaequalibus, prope marginem laxe conjunctis, nervulis reticulatis; inflorescentia masculina terminalis, 2-3 mm. longe pedunculata, floribus 3-7, capitatis, sessilibus; calyx late campanulatus, 1 mm. longus, minute puberulus, truncatus, dentibus

obsoletis; corolla extus minutissime puberula, tubo viridi, 7-8 mm. longo, superne angustato, fauce contracto, recto vel paullo curvato, intus glabro, lobis 4, albis, glabris, late ovatis, 2.5-3 mm. longis, patentibus, acutis vel abrupte breviterque acuminatis; stamina prope basin tubi inserta, filamentis 1 mm. longis, glabris, antheris linearibus, 3 mm. longis; discus crassus, a tubo calycino liber; bacca 1 cm. diam., nigra.—Bolivia: Forests of the campos region, Buena-vista, Prov. Sara, Dept. Santa Cruz, alt. 450 m., October 9, 1924, José Steinbach 6597 (Herb. Field Mus. No. 573,427, type).

Vernacular name, "nigua." Fruit sweet, edible.

Related, according to description, to *A. myrciifolia* Schum., of Brazil. That species differs in its oblong coriaceous leaves and longer anthers.

Randia concinna Standl., sp. nov.—Arbor, ramis 3-7 mm. crassis, subteretibus, rimosis, cinnamomeis vel griseis, ad apices foliatis, novellis glabris, internodiis 5-10 mm. longis; stipulae foliaceae, deciduae, ovales vel ovato-ovales, 1-2.5 cm. longae, 9-16 mm. latae, apice rotundatae, virides, glabrae vel prope basin sparse setulosae; folia opposita, petiolis validis, 1-2.2 cm. longis, supra sulcatis, sparse hispidulis vel glabratis; limbus ovato-ovalis vel late ovato-ellipticus, 6.5-12.5 cm. longus, 4-7.5 cm. latus, acutiusculus, basi rotundatus, membranaceus, supra viridis, glaber, nervis subimpressis, subtus paullo pallidior, ad axillas sparse albido-barbatus, costa elevata, valida, nervis lateralibus utroque latere c. 8, adscendentibus, fere rectis, remote a margine laxe conjunctis; fructus globosus, 3 cm. diam., laevis, nitidus, 4-locularis; semina numerosa, compressa, pallide brunnea, 6 mm. lata.—Mexico: Along stream bed, San Sebastián, Hacienda del Otatal, Sierra Madre Occidental, Jalisco, alt. 1,500 m., February 15, 1927, Ynes Mexia 1690 (Herb Field Mus. No. 579,911, type). Duplicate in U. S. Nat. Herb.

"Limoncillo." Said to be a large tree.

Only sections of the fruit are available for study. The true generic position of the tree will be problematical until the flowers are collected. The large broad stipules are scarcely to be expected in the genus *Randia*, but at present no better generic disposition suggests itself.

Randia panamensis Standl., sp. nov.—Ramuli graciles, 1.5-2.5 mm. crassi, teretes, recti, cinnamomei, puberuli, lanticellis sparsis pallidis paullo elevatis notati, ad axillas interdum spinosi, spinis gracilibus, rigidis, adscendentibus, 5-7 mm. longis, internodiis elongatis; stipulae lanceolatae, subulato-acuminatae, 5-8 mm. longae, erectae, brunneae, multinerviae; folia ad apices ramorum congesta, petiolis gracilibus, 3-6 mm. longis, strigillosis; limbus obovato-oblongus vel oblanceolato-oblongus, 4.5-12.5 cm. longus, 2-4.5 cm. latus, subabrupte breviterque acuminatus, acumine obtuso vel acuto, basi

acutus vel acuminatus, membranaceus, supra viridis, glaber, nervis saepe subimpressis, subtus paullo pallidior, ad nervos strigosus, in axillis breviter barbatus, costa gracili, elevata, nervis lateralibus utroque latere c. 10, angulo acuto adscendentibus, fere rectis, remote a margine conjunctis; flores pauci, terminales, fasciculati, pedicellis 5-6 mm. longis, griseo-strigosis; calyx partitus, lobis 5, linearisubulatis, 5-7 mm. longis, trinerviis, adpresso-ciliatis; corolla ochroleuca, tubo 2 cm. longo, basi 1.5 mm. lato, fauce 3 mm. lato, dense griseo-strigilloso, lobis ovalibus vel rotundatis, 5-6 mm. longis, apice rotundatis, extus sparse et minute strigilosis, intus glabris; apices antherarum paullo exserti.—Panama: Flat Rock, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 213 (Herb. Field Mus. No. 579,675, type).

Probably related to *R. armata* (Swartz) DC., but in that common species of tropical America the corolla tube is larger and the spines are longer.

Guettarda boliviiana Standl., sp. nov.—Rami crassi, teretes, lenticellati, fusco-brunnei, novellis pilis brevibus patentibus dense pilosis, internodiis elongatis; stipulae linearis-lanceolatae, 6-8 mm. longae, deciduae, extus strigosae; folia opposita, petiolo gracili, 1.5-2.5 cm. longo, dense hirtello; limbus oblongo-ellipticus vel late ellipticus, 5.5-13 cm. longus, 2.5-7.5 cm. latus, apice acutus vel plerumque abrupte acuminatus, acumine acuto, membranaceus, supra viridis, sparse pilis brevibus adpressis pilosus vel cito glabratus, nervis prominulis, subtus pallidior, ubique pilis brevibus adpressis vel ad nervos patentibus pilosus, costa gracili, elevata, nervis lateralibus utroque latere c. 9, angulo acuto adscendentibus, gracilibus, elevatis, leviter curvatis, juxta marginem conjunctis; cymae densae, multiflorae, 2-4 cm latae, 4-11 cm longe pedunculatae, pedunculo valido, densissime breviterque piloso, ramulis primariis ad 1.5 cm. longis, bracteis lanceolatis vel linearibus, sericeis; hypanthium 2 mm. longum, basi rotundatum, adpresso-pilosulum; calyx tubulosus, 1.5-2 mm. longus, truncatus vel obsolete et brevissime lobatus, adpresso pilosulus; corolla dense cinereo-sericea, tubo 19 mm. longo, superne sensim dilatato, ore 3 mm. lato, lobis 5, ovali-oblongis, 6 mm. longis, apice obtusis vel rotundatis, intus secus costam adpresso-pilosus; antherae lineares, inclusae, 3 mm. longae; stylus gracilis, inferne pilosus, superne glaber.—Bolivia: Cercado, Prov. Sara, Dept. Santa Cruz, alt. 400 m., November 27, 1925, José Steinbach 7351 (Herb. Field Mus. No. 573,532, type). Buena Vista, Prov. Sara, alt. 450 m., Steinbach 7355.

In general appearance this plant suggests the original plate of the Peruvian *G. aromatica* Poepp. & Endl., but that species has a shorter corolla. The Bolivian specimens were distributed as *G. Burchelliana* Muell., of Brazil, but in that, as described, the lateral nerves of the leaves are divergent at a wide angle, and the petioles are only 4-6 mm. long.

Guettarda Rusbyi Standl., sp. nov.—Arbor ramulis crassis, fusco-brunneis, teretibus, novellis strigillossis, internodiis 6-12 mm. longis; stipulae late ovatae, 3 mm. longae, deciduae, extus strigosae; folia opposita, petiolo gracili, 3-8 mm. longo, supra late sulcato, sparse puberulo et strigilloso; limbus ovato-ellipticus, ovali-ellipticus, ellipticus, vel interdum oblongo-ellipticus, 5-12.5 cm. longus, 2-5 cm. latus, abrupte vel sensim acuminatus, acumine triangulari, attenuato, basi rotundatus vel obtusus, crasse membranaceus, supra viridis, scaberulus vel glabratus, nervis prominulis, subtus fere concolor, ad nervos strigillosos vel rarius puberulus, costa gracili, elevata, nervis lateralibus utroque latere c. 6, angulo acuto adscendentibus, leviter curvis, prope marginem conjunctis; cymae axillares, dense pauciflorae, 5-6 cm. longe pedunculatae, pedunculo gracili, dense griseo-puberulo, ramulis primariis 3 mm. longitudine non superantibus, floribus sessilibus; corollae tubus gracilis, 10-13 mm. longus, 1-1.5 mm. crassus, pilis adscendentibus albidis dense sericeus, lobis ovalibus, 2.5-3 mm. longis, extus sericeis, intus glabris vel ad basin villosulis; drupa ovalis, 7-12 mm. longa, 4-6 mm. crassa, basi et apice rotundata, minute et densissime tomentosa, 4-locularis; calyx ad apicem drupae persistens, tubulosus, 1.5-2 mm. longus, tomentellus, truncatus vel obscure lobatus.—Colombia: Rocky hill at gorge above Natagaima, Dept. Huila, alt. 450-500 m., August 12, 1917, H. H. Rusby and F. W. Pennell 1154 (Herb. Field Mus. No. 485,881, type; duplicates in U. S. Nat. Herb. and herb. N. Y. Bot. Gard.). Along stream, Espinal to Cuamo, Tolima, alt. 400 m., Pennell and Rusby 200 (N. Y.). Piedras, alt. 600 m., André 1940 (N. Y.), 1898 (N. Y.). Without locality, Funck and Schlim 644 (N. Y.); Lehmann 8677 (N. Y.). Above Honda, Holton 409 (N. Y.).

The specimens cited exhibit considerable variation in shape of leaves and in pubescence, and it is possible that more than one species is represented, although I have been unable to find characters by which they may be separated satisfactorily. *Guettarda Rusbyi* is related to *G. odorata* Jacq., differing in its much larger, oval rather than globose fruit, and slightly larger calyx and hypanthium.

Guettarda malacophylla Standl., sp. nov.—Rami teretes, crassi, fusi, novellis subcompressis, densissime pilis fulvis brevibus patentibus pilosis, internodiis brevibus; stipulae triangulares, acuminatae, fusco-brunneae, extus strigosae, caducae; folia opposita, petiolo crasso, 1.5-4 mm. longo, dense piloso; limbus ovalis, obovato-ovalis, vel obovato-ellipticus, 3.5-6 cm. longus, 1.7-3.3 cm. latus, subabrupte breviterque acuminatus vel obtusus, acumine acuto, basi obtusus vel late rotundatus, crasse membranaceus, supra viridis, dense molliterque brevipilosus, nervis prominulis, subtus griseus, densissime pilis brevibus, patentibus velutino-pilosus, costa et nervis gracilibus, elevatis, nervis lateralibus utroque latere c. 10, angulo acuto adscendentibus, leviter arcuatis, prope marginem laxe conjunctis; flores cymoso-capitati, cymis densis, paucifloris, ad 4 mm. longe peduncu-

latis, pedunculo crasso, floribus sessilibus, bracteis lanceolatis, calycem aequantibus vel brevioribus; hypanthium subglobosum teres, 1.2 mm. longum, dense tomentosum; calyx tubulosus, 1.7 mm. longus, minute puberulus, truncatus vel obscure bilobatus; corolla extus dense cinereo-sericea, pilis adscendentibus, tubo gracili, 7-8 mm. longo, 1 mm. lato, lobis ovali-oblongis, 2.5 mm. longis; ovarium 4-loculare.—Colombia: On Río Magdalena, Neiva and Timana, alt. 400-1,200 m., "November," F. C. Lehmann 8710 (Herb. N. Y. Bot. Gard., type).

Among the Colombian species this may be recognized readily by the small, densely pubescent leaves and small, headlike, nearly sessile inflorescence.

Guettarda sabiceoides Standl., sp. nov.—Ramuli graciles, teretes, fusco-brunnei, glabri, novellis strigosis et puberulis, internodiis 1-4.5 cm. longis; stipulae late ellipticae vel obovatae, 1.5 cm. longae, abrupte acuminatae, deciduae, fusco-brunneae, extus sparse, prope basin densius, strigosae; petioli graciles, 2-3 cm. longi, sparse strigilosi et puberuli vel glabri; limbus oblongo-ellipticus vel ovato-ellipticus, 10-15.5 cm. longus, 4-7 cm. latus, abrupte acuminatus, membranaceus, supra viridis, glaber, nervis non elevatis, subtus pallide viridis, ad nervos et nervulos minute sericeus, costa et nervis gracibus, prominentibus, nervis lateribus utroque latere c. 15, adscendentibus, arcuatis; inflorescentiae axillares, furcatae, 6-10 mm. longe pedunculatae, pedunculo scaberulo-puberulo, ramis 1-2 cm. longis, dense multifloris, floribus secundis, sessilibus; hypanthium calyce adpresso 1.5-2 mm. longum, pentagonum, minute griseotomentosum et hirtellum; calyx breviter 5-dentatus, dentibus late triangularibus, acutiusculis; corolla in alabastro 6-7 mm. longa, tubo crasso, pilis brevibus fulvis reflexis dense obtecto; drupa (immatura?) ovalis, 5 mm. longa, profunde 5-sulcata, minute tomentosa, putamine 5-loculari.—Colombia: Forests of the Río Palacé, highlands of Popayán, alt. 1,500-1,800 m., February, 1886, F. C. Lehmann B. T. 960 (Herb. N. Y. Bot. Gard., type). Without locality Lehmann B. T. 860 (N. Y.).

Guettarda sabiceoides is related to the West Indian *G. crispiflora* Vahl, differing from that in its narrower leaves, smaller flowers, and 5-celled ovary. This is probably the plant reported from Bogotá by Kunth (HBK. Nov. Gen. & Sp. 3: 420. 1819) as *G. crispiflora*.

Guettarda ocoteaefolia Standl., sp. nov.—Ramuli crassiusculi, subteretes, fusco-brunnei, novellis strigillosis, internodiis 0.5-2.5 cm. longis; stipulae late ovato-triangulares, subulato-cuspidatae, 6.5 mm. longae, fusco-brunneae, tenues, extus dense strigillose, deciduae; folia opposita, petiolo gracili, 0.5-2 cm. longo, supra sulcato, puberulo et strigilloso; limbus oblanceolato-oblongus vel oblongo-ovatus, 7.5-18 cm. longus, 3-9.5 cm. latus, apice obtusus vel fere rotundatus et abrupte breviterque acuminatus, interdum acutus, acumine tri-

angulari, acuto, 3-5 mm. longo, basin versus angustatus, basi ipsa acuta vel obtusa et plus minusve inaequali, interdum rotundata, crasse membranaceus, supra viridis, minute scaberulus vel glabratius, subnitidus, nervis prominulis, subtus paullo pallidior, sparse et minute strigilosus vel glabratius, ad nervos puberulus, costa gracili, elevata, nervis lateralibus utroque laterè c. 9, angulo acuto valde adscendentibus, gracillimis, prominentibus, juxta marginem conjunctis; cymae densae, pauciflorae, axillares, 3-4.3 cm. longe pedunculatae, pedunculo crasso, densissime pilis brevibus ochraceis patentibus piloso, ramulis primariis 4 mm. longitudine non superantibus, floribus sessilibus, bracteis lanceolatis, ad 4 mm. longis, deciduis; hypanthium 2 mm. longum, tomentosum; calyx 3 mm. longus, late tubulosus, truncatus vel brevissime lobatus, pilis brevibus adscendentibus fulvescentibus induitus; corolla extus dense pilis adscendentibus cinereo-sericea, tubo 1.5 mm. longo, fere 3 mm. lato, superne vix dilatato, lobis 5, ovalibus, 5-6 mm. longis, intus glabris, patentibus; antherae subexsertae.—Colombia: Near Panche, alt. 1,550 m., February 18, 1876, E. André 1670 (Herb. Field Mus. No. 537,218, type; duplicate in herb. N. Y. Bot. Gard.). Fusagasugá, alt. 1,800 m., André 1448 (N. Y.).

From *G. Rusbyi* this species differs in the larger, proportionately narrower leaves of different shape, and in the stout, densely pubescent peduncles.

Anisomeris rauwolfioides Standl., sp. nov.—Arbor parva 4 m. alta, ramulis gracilibus, teretibus, rimosis, griseis vel ochraceis, novellis adpresso-pilosulis vel puberulis, internodiis 1-3 cm. longis; stipulae late triangulares, persistentes, erectae, 3 mm. longae, subulato-caudatae, brunneae; petioli 2-3 mm. longi, supra late sulcati, ciliati; limbus ellipticus vel oblongo-ellipticus, 3.5-5.5 cm. longus, 1.7-2.7 cm. latus, apice acutus, obtusus, vel interdum rotundatus, basi obtusus vel acutus, membranaceus, supra obscure viridis, glaber, costa paullo elevata, nervis inconspicuis, subtus pallidior, in axillis nervorum lateralium barbatus, costa gracili, elevata, nervis lateralibus utroque latere 5-6, gracillimis, inconspicuis, fere rectis, angulo acuto adscendentibus, remote a margine laxe conjunctis; flores cymoso-capitati, cymis 3-5-floris, 13-20 mm. longe pedunculatis, pedunculo filiformi, glabro, floribus sessilibus, bracteis minutis; hypanthium oblongum, 1.5 mm. longum, glabrum; calyx 1.5 mm. longus, profunde lobatus, glaber, lobis ovato-oblongis, obtusis, erectis; corolla alba, extus dense pilulis adpressis adscendentibus albidis obtecta, tubo 10-12 mm. longo, gracili, superne paullo dilatato, medio fere 1 mm. lato, lobis 4, ovalibus, 2-2.5 mm. longis, apice obtusis vel rotundatis, intus glabris; apices antherarum subexsertae.—Bolivia: Edge of forest, Río Palometillas, Prov. Sara, Dept. Santa Cruz, alt. 400 m., December 19, 1924, José Steinbach 6768 (Herb. Field Mus. No. 563,841, type).

Vernacular name, “espino blanco.” In spite of the native name, there is no evidence that the branchlets ever are spinose.

Anisomeris rauwolfioides is a relative of *A. albicaulis* (Rusby) Standl., the latter differing in its pubescent leaves (described incorrectly as glabrous) and pubescent calyx.

Anisomeris apodantha Standl., sp. nov.—Rami crassi, teretes, ochracei, lenticellati, internodiis 4-7 cm. longis; stipulae deciduae, non visae; petioli graciles, 1-2.3 cm. longi, supra profunde et anguste sulcati, dense strigillosae; limbus (perfectus non visus) ellipticus, 12-15 cm. longus vel longior, ad 6 cm. latus, basi subabrupte acutus, membranaceus, supra viridis, glaber, nervis non elevatis, subtus paullo pallidior, ubique sed ad nervos densius pilis brevissimis strigilosus, costa gracili, elevata, nervis lateralibus utroque latere c. 10, gracillimus, elevatis, angulo acuto adscendentibus, arcuatis, marginem fere attingentibus, nervulis obsoletis; flores in axillis et ad nodos ramorum defoliatos congesti, inflorescentiis densis, multifloris, sessilibus, floribus sessilibus; hypanthium oblongum, 2 mm. longum, cinereo-strigosum; calyx tubulosus, 2.5-3 mm. longus, stri-gosus, profunde lobatus, lobis linear-lanceolatis, attenuatis, erectis; corolla in alabastro anguste linearis, superne vix dilatata, dense pilis adpressis adscendentibus cinereis obtecta, tubo fere filiformi, 17-20 mm. longo, medio vix 1 mm. lato, lobis 4, linear-lanceolatis, acutis, versus apicem longe sensimque attenuatis, intus glabris, 4-5 mm. longis; antherae inclusae; stylus filiformis, glaber.—Bolivia: Río Surutú, Prov. Sara, Dept. Santa Cruz, alt. 400 m., October 20, 1925, José Steinbach 7263 (Herb. Field Mus. No. 573,478, type).

Somewhat resembling *A. boliviiana* (Standl.) Rusby, but differing conspicuously in the large leaves, dense sessile many-flowered inflorescences, and long corolla tube.

Anisomeris albicaulis (Rusby) Standl., comb. nov. *Guettarda albicaulis* Rusby, Mem. Torrey Club 6: 47. 1896.

Anisomeris brachypoda (Donn. Smith) Standl., comb. nov. *Chomelia brachypoda* Donn. Smith, Bot. Gaz. 47: 255. 1909.

Anisomeris Pringlei (Wats.) Standl., comb. nov. *Chomelia Pringlei* Wats. Proc. Amer. Acad. 26: 137. 1891.

Anisomeris microloba (Donn. Smith) Standl., comb. nov. *Chomelia microloba* Donn. Smith, Bot. Gaz. 31: 114. 1901.

Anisomeris protracta (Bartl.) Standl., comb. nov. *Guettarda protracta* Bartl.; DC. Prodr. 4: 457. 1830.

Anisomeris paniculata (Bartl.) Standl., comb. nov. *Guettarda paniculata* Bartl.; DC. Prodr. 3: 457. 1830. *Stenostomum paniculatum* Poepp. & Endl. Nov. Gen. & Sp. 3: 27. pl. 232, f. a-e. 1845.

The type was collected in the mountains of Peru by Haenke. The writer would refer here *Matthews 1944* (Herb. N. Y. Bot. Gard.) from Peru, an *Anisomeris* which agrees well with the original description and with the amplified description and the figure given by Poeppig and Endlicher.

Coussarea euryphylla Standl., sp. nov.—Frutex, ramulis gracilibus, sparse pilis albidis nitidulis sericeis, internodiis elongatis; stipulae deciduae, interpetiolares, lineari-lanceolatae, 13 mm. longae, basi 4 mm. latae, erectae, longiattenuatae, extus dense griseo-sericeae; folia opposita, petiolo valido, 3-4 cm. longo, supra canaliculato, sparse vel basin versus magis dense sericeo, limbo elliptico, 27-35 cm. longo, 12-15.5 cm. lato, apice obtuso vel subrotundato et abrupte caudato-acuminato, acumine e basi triangulari lineari, c. 3 cm. longo, basi acuto vel abrupte acuminato et decurrente, membranaceo, supra viridi, sparse vel ad nervos densius pilis longis tenuissimis sericeo vel glabratu, nervis non elevatis, subtus paullo pallidiore, sparse pilis longis adpressis piloso vel glabratu, costa gracili, elevata, nervis lateralibus utroque latere c. 13, angulo lato divergentibus, arcuatis, juxta marginem laxe conjunctis, gracilibus, elevatis, nervulis prominentibus, laxe reticulatis; flores paniculati, panicula terminali, 10 cm. longa, 8 cm. lata, laxe multiflora, pedunculata, pedunculo 2.5 cm. longo, pedicellis gracilibus, 6-12 mm. longis, sericeis; bracteae primariae stipuliformes, lanceolatae vel lineares, 2-6 mm. longae; hypanthium subglobosum, 1.5 mm. longum, breviter et sparse pilosulum; calyx 1.5 mm. longus, sparse adpresso-pilosulus, truncatus, remote 5-denticulatus; corolla alba, extus minutissime puberula, tubo 11 mm. longo, 1 mm. crasso, lobis 5, linearibus, 6 mm. longis, 0.8 mm. latis, ad apicem acutum attenuatis, recurvatis; stamina inclusa.—Panama: Buena Vista Camp on Chiriquí Trail, alt. 375 m., 1928, G. P. Cooper 228 (Herb. Field Mus. No. 579,282, type), 585a.

A low shrub with fragrant flowers. Because of the absence of fruits, the generic position of the plant is somewhat uncertain.

Faramea bullata Standl., sp. nov.—Arbor parva 4.5 m. alta, omnino glabra, trunco 5 cm. diam., ramulis validis, compressiusculis, viridibus, laevibus, internodiis 5-5.5 cm. longis; stipulae intrapetiolares, basi breviter connatae, 7-10 mm. longae, crassae, persistentes, parte libera late ovata, cuspidato-acuminata; folia opposita, petiolo crasso, 6-8 mm. longo, supra late sulcato, limbo oblongo vel anguste oblongo, 15-21 cm. longo, 5.5-7 cm. lato, subabrupte acuminato, acumine c. 2 cm. longo, obtuso, basi breviter cordato vel rarius rotundato, subcoriaceo, supra viridi, nitidulo, bullato, costa elevata, nervis conspicuis, subtus glaucescente, pruinoso, triplinervio, costa valida, elevata, nervis submarginalibus gracilibus, e margine 5-6 mm. distantibus, nervis lateralibus utroque latere c. 17, angulo lato divergentibus, elevatis, fere rectis, nervulis

prominentibus, laxe reticulatis; flores cymoso-paniculati, paniculis c. 5 cm. longis et 6 cm. latis, dense multifloris, pedunculatis, pedunculo crasso, 3 cm. longo, pedicellis crassis, 1-6 mm. longis; hypanthium oblongum; calyx 1 mm. longus, 1.5 mm. latus, 5-lobus, lobis triangularibus, acuminatis; corolla caerulea, in alabastro 9 mm. longa, tubo gracili, 4.5 mm. longo, 1.2 mm. crasso; fructus depresso-globosus, 10-14 mm. latus, 7 mm. longus, 8 mm. crassus, basi rotundatus et abrupte contractus, apice truncatus, laevis; semen griseum, basi profunde et anguste exsculptum, laeve, c. 1 cm. longum.—Panama: Kankintoe, 10 miles above Holstein, region of Almirante, Province of Bocas del Toro, 1928, G. P. Cooper 507 (Herb. Field Mus. No. 579,385, type).

The species is well distinguished by the long narrow triplinerved bullate leaves. Between the principal submarginal nerves and the margin there is a very slender nerve, close to the margin, and the leaves, therefore, are perhaps to be regarded rather as quintuplinerved.

Cephaelis sessilifolia Standl., sp. nov.—Frutex glaber, ramiculis gracilibus, viridibus, subteretibus, laevibus, internodiis 1.5-7 cm. longis; stipulae bipartitae, erectae, persistentes, lobis linearis-subulatis, rigidis, viridibus; folia sessilia, obovato-elliptica vel rarius oblongo-elliptica, 5.5-9.5 cm. longa, 2-5.5 cm. lata, apice obtusa vel fere rotundata et abrupte breviterque acuminata, acumine 3-5 mm. longo, acutiusculo, rarius acuminata, basin versus plerumque paullo angustata, basi ipsa acuta vel rotundata, membranacea, supra nitida, laete viridis, nervis paullo elevatis, subtus pallidior, costa et nervis gracilibus, elevatis, nervis lateralibus utroque latere c. 10, angulo lato adscendentibus, valde arcuatis, juxta marginem conjunctis; flores capitati, capitibus terminalibus, densis, paucifloris, speciose bracteatis, pedunculo gracili, erecto, 7-15 mm. longo; bracteae exteriore late ovatae, 1.5 cm. longae, 1 cm. latae, acutae, interioribus angustioribus; drupa coerulea, pyreni 4 mm. longis, 4 mm. latis, dorso crasse corrugatis, facie ventrali longitrussum sulcatis.—Mexico: On canyon wall, Quimixto, trail from San Pedro el Tuito, Jalisco, alt. 60 m., December 2, 1926, Ynes Mexia 1240 (Herb. Field Mus. No. 579,912, type).

A spreading shrub. Fruit bright blue. Bracts dark red.

Of the three species of *Cephaelis* known previously from Mexico only one, *C. chiapensis* Standl., has sessile leaves. In that species the leaves are narrower and long-acuminate, and the bracts are green.

Cephaelis guapilensis Standl., comb. nov. *Evea guapilensis* Standl. Journ. Washington Acad. Sci. 15: 104. 1925.

Cephaelis chiapensis Standl., comb. nov. *Evea chiapensis* Standl. Contr. U. S. Nat. Herb. 23: 1392. 1926.

Cephaelis campyloneuroides Standl., comb. nov. *Evea campyloneuroides* Standl. Contr. U. S. Nat. Herb. 18: 123. 1916.

Cephaelis dichroa Standl., comb. nov. *Evea dichroa* Standl. Contr. U. S. Nat. Herb. 18: 124. 1916.

Psychotria Mexiae Standl., sp. nov.—Arbor parva, ramulis crassiusculis, subteretibus, vetustioribus ochraceis, rimosis, novellis glabris, internodiis 6-14 mm. longis; stipulae intrapetiolares, oblongo-ovatae, 17 mm. longae, longiacuminatae, tenues, brunneae, caducae, glabrae; folia opposita, petiolis 6-12 mm. longis, crassis, saepe fere ad basin marginatis; limbus elliptico-oblongus vel obovato-oblongus, 8.5-16.5 cm. longus, 2.5-7 cm. latus, abrupte acuminatus vel longiacuminatus, acumine e basi triangulari attenuato, obtuso, recto vel subfalcato, basi abrupte attenuatus et longe decurrentis, crasse membranaceus, utrinque glaber, supra viridis, costa paullo elevata, nervis vix prominulis, subtus paullo pallidior, costa et nervis gracilibus, elevatis, nervis lateralibus utroque latere 10-11, angulo lato divergentibus, leviter arcuatis, prope marginem laxe conjunctis, nervulis obscuris; flores cymoso-paniculati, paniculis terminalibus, sessilibus, e basi ramosis, sublaxe multifloris, 4-7 cm. longis, ramulis sparse puberulis, pedicellis 1-2 mm. longis vel nullis; calyx ad apicem drupae persistens, 0.5 mm. longitudine vix superans, remote et brevissime denticulatus; drupa globosa, 3-4 mm. diam., glabra, obtuse multicostata, pyrenis facie ventrali fere planis.—Mexico: Wooded ravine on mountain side, Santa Cruz de Vallarta, Jalisco, alt. 700 m., December 9, 1926, Ynes Mexia 1262 (Herb. Field Mus. No. 579,924, type).

A small understory tree. Flowers (not present on the specimens) white. Fruit at first green, turning orange and finally red.

Like so many Psychotrias, this plant has no outstanding differential characters, but it differs in some important detail from each of the species known from Mexico.

Psychotria Cooperi Standl., sp. nov.—Arbor 7.5-9 m. alta, trunco 10-12.5 cm. diam., ramulis gracilibus, subteretibus, viridibus, glabris, internodiis 1.5-3.5 cm. longis; stipulae interpetiolares, suborbicularis, 4-6 mm. longae, apice late rotundatae, crassae, glabrae, persistentes; petioli graciles, 13-17 mm. longi, glabri; limbus oblanceolato-oblongus, 9-16 cm. longus, 3-6 cm. latus, abrupte acuminatus, acumine acuto, c. 1 cm. longo, basi acutus vel acuminatus, membranaceus, supra viridis, ad costam sparse pilosulus, costa elevata, nervis lateralibus conspicuis sed non elevatis, subtus paullo pallidior, ad nervos pilis paucis albis adscendentibus pilosulus, costa gracili, elevata, nervis lateralibus utroque latere c. 12, angulo lato adscendentibus, arcuatis, juxta marginem conjunctis; flores cymoso-corymbosi, inflorescentiis terminalibus, densissime multifloris, sessilibus,

2-3 cm. longis, pedicellis validis, 2-6 mm. longis, superne paullo incrassatis, glabris; calyx vix 1 mm. longus, glaber, 5-lobatus, lobis inaequalibus, triangularibus, acutis, erectis, in apice fructus conniventibus; corolla alba, extus glabra, 5 mm. longa, fauce barbata, tubo superne paullo dilatato; drupa purpurea, clavato-ovoides, 4-5 mm. longa, basi obtusa, apice truncata, 2-pyrena, pyrenis dorso 5-costatis.—Panama: Buena Vista Camp on Chiriquí Trail, alt. 375 m., 1928, G. P. Cooper 577; Yale No. 12,210 (Herb. Field Mus. No. 579,633, type). Cricamola Valley, region of Almirante, Province of Bocas del Toro, Cooper 540.

“Cocobolito.”

The species is marked by the very dense, sessile inflorescences which often appear to be axillary because of the growth of branches which appear on each side of them.

Didymaea linearis Standl., sp. nov.—*Herba perennis e basi lignosa, dense ramosa, c. 60 cm. longa, ramulis pallidis, obtuse quadrangulatis, 2 mm. crassis, novellis minute et sparsissime scaberrulis vel fere glabris, dense foliatis; folia opposita, sessilia, linearia, 5-17 mm. longa, 0.8-1.5 mm. lata, cuspidato-apiculata, basi paullo angustata, rigidula, 1-nervia, supra viridia, sparse scaberula, subtus paullo pallidiora, glabra; stipulæ fere 1 mm. longæ, bifidae, lobis subulato-filiformibus, recurvatis; flores ad apices ramulorum solitarii, pedicello 7 mm. longo, angulato, superne paullo incrassato; fructus didyminus, carnosus, glaber, nitidus, laevis, inter coccus constrictus, 7-8 mm. latus, 5 mm. altus.*—Mexico: Real Alto, Peña Gorda, Sierra Madre Occidental, Jalisco, alt. 2,500 m., February 21, 1927, Yves Mexia 1726 (Herb. Field Mus. No. 579,896, type).

“Esculcona.” A vine, pendent from crevices of rocks.

Of the genus *Didymaea* there has been known heretofore only a single species, *D. mexicana* Hook. f., ranging from south-central Mexico to Costa Rica. This Jalisco plant adds an interesting second species to the genus. *D. mexicana* differs conspicuously in aspect from *D. lincaris* because of its large, lanceolate to ovate leaves.

Relbunium glaberrimum Standl., sp. nov.—*Herba ramosa omnino glabra, caulis gracilibus, obtuse tetragonis, lucidis, internodiis elongatis, foliis longioribus; folia quaterna, sessilia, ovalia vel ovato-elliptica, 5-8 mm. longa, 2.5-4.5 mm. lata, apice obtusa vel brevissime acuminata, basi rotundata vel obtusa, coriacea, lucida, in siccitate nigrescentia, 1-nervia, margine valde revoluta; pedicelli axillares, solitarii, foliis aequilongi vel breviores, crassiusculi, tetragoni, erecti; involucri bracteæ aequales, 1.5-3 mm. longæ, ovatae vel ellipticae, breviter acuminatae, eciliatae, crassæ; ovarium glabrum; corolla brevissima, glabra.*—Venezuela: Exposed dry ridge, Cerro de Turumiquire, alt. 1,800 m., 1925, G. H. H. Tate 310

(U. S. Nat. Herb. No. 1,230,935, type); alt. 2,925 m., *Tate* 238
(U. S.).

From all the South American species of *Relbunium* this is distinguished by the complete absence of pubescence. Otherwise it resembles *R. nitidum* (HBK.) Schum.

Galium pumilio Standl., sp. nov.—Herba perennis humillima compacta, dense ramosa, caulis gracillimus, 2.5-4 cm. longis, glabris; folia 4- vel 6-natim verticillata, plerumque imbricata et internodiis longiora, sessilia, oblonga vel ovata, 1.5-2.5 mm. longa, 0.7-1.2 mm. lata, obtusa vel acutiuscula, piloso-apiculata, basi obtusa, crassa, plana vel subrevoluta, glabra, ciliata; flores axillares, solitarii, pedicellis crassiusculis, 4-8 mm. longis, glabris, erectis; fructus carnosus, didymus, glaber, c. 1 mm. longus et 1.3 mm. latus.—Peru: On western grassy limestone slope, Cerro de Pasco, alt. 4,200 m., March 28, 1923, *J. Francis Macbride* 3070 (Herb. Field Mus. No. 534,140, type).

In its reduced size and minute ciliate leaves this plant is unlike any of the other *Galium* species of western South America.

Galium limense Standl., sp. nov.—Herba perennis diffusa procumbens, caulis gracilis, obtuse tetragonis, viridibus, sparse uncinulatis, internodiis foliis aequilongis vel multo longioribus; folia quaterna, oblongo-ovata, 5-8 mm. longa, 1.5-3 mm. lata, sessilia, acuminata, basi obtusa, crassiuscula, 3-nervia, supra hirtello-scaberrula, subtus glabra, margine plana vel recurva; flores parvi, inconspicui, in cymis plerumque trifloris axillaribus et terminalibus dispositi, pedicellis gracilis, erectis vel dependentibus, glabris; ovarium dense albido-pilosum, 1.4 mm. latum; corolla subrotata, viridis, 1.5 mm. longa, profunde in lacinias 3 oblongo-ovatas acutas divisa, glabra; fructus siccus, 2.5 mm. latus, 1.5 mm. longus, dense breviterque uncinulato-hispidulus.—Peru: Open rocky slope, Canta, Dept. Lima, alt. 2,700-2,900 m., June 11-19, 1925, *Francis W. Pennell* 14,351 (Herb. Field Mus. No. 558,431, type).

This is a relative of *G. canescens* HBK., but from that and other related species it may be separated easily by the glabrous under surface of the leaves.

CUCURBITACEAE

Anguria Dunlapii Standl., sp. nov.—Tota glabra, caulis gracilis, 1.5 mm. crassis, sulcatis, internodiis 4.5-6 cm. longis; folia simplicia, petiolo gracili, 1.2-2 cm. longo; lamina late ovato-oblonga, 10-11 cm. longa, 4-5 cm. lata, apice obtusa vel acutiuscula et breviter cuspidato-apiculata, acumine angusto, attenuato, c. 3 mm. longo, basi brevissime cordata, membranacea, integra, supra viridis, subtus paullo pallidior, basi 5-nervia, costa crassiuscula, plana, nervis lateralibus inaequalibus, planis, gracilibus, angulo recto vel lato

divergentibus, remote a margine conjunctis; flores masculi capitati, pedunculo gracili, 10.5-15 cm. longo, apice paucifloro, floribus sessilibus; receptaculum cylindricum, 8 mm. longum, 2 mm. latum, basi obtusum, superne paullo constrictum, striatum, intus parte superiore sparse pilosum; sepala suberecta, crassa, ovata, 1.5 mm. longa, obtusa; petala 1.5 mm. longa, suborbicularia, brevissime unguiculata; antherae rectae, oblongae, fere 4 mm. longae, 1 mm. latae, inappendiculatae.—Panama: Farm Six, Changuinola Valley, March 3, 1924, V. C. Dunlap 490 (Herb. Field Mus. No. 580,000, type).

Related to *A. longipedunculata* Cogn., which is reported from Mexico and Costa Rica, but that species differs in its longer receptacle, larger petals, and much longer anthers.

COMPOSITAE

Dyssodia ciliosa (Rydb.) Standl., comb. nov. *Boebera ciliosa* Rydb. N. Amer. Fl. 34: 167. 1915.

STUDIES OF AMERICAN PLANTS—II

PAUL C. STANLEY

The present paper consists almost wholly of descriptions of new species of trees and shrubs from tropical America. About half of the plants described as new belong to the family Rubiaceae, and represent a partial result of the writer's recent studies in this group, preparatory to a monographic treatment of the Rubiaceae native in western South America.

Most of the plants of other families described here are from Honduras, and were collected by the writer during a visit to the northern coast of that country in the winter of 1927-28. The flora of the lowlands of Honduras does not appear to be so interesting or so varied as that of Costa Rica or Panama, but in view of the fact that scarcely any botanical collecting had been done there previously, it was to be expected that a substantial number of new species would appear in the collection..

MORACEAE

Ficus Popenoei, sp. nov.—Arbor mediocris, ramulis crassis densissime brunneo- vel ferrugineo-hirsutis, internodiis brevibus; stipulae deciduae, 18 mm. longae, tenues, brunneae, extus dense pilis fulvis adpresso-hirsutae, subulato-attenuatae; folia breviter petiolata, petiolo 0.8-2.3 cm. longo dense hirsuto valido; lamina crasse membranacea vel fere subcoriacea, ovalis vel ovari-ovata, 7-21 cm. longa, 4-7.5 cm. lata, apice late rotundata, interdum obscure apiculata, basin versus paullo angustata, basi ipsa cordata vel late rotundata, supra viridis, dense hispidula vel glabrata, costa et nervis plus minusve prominentibus, subtus vix pallidior, ubique dense pilis brevibus patentibus velutino-pilosula, costa crassa elevata, nervis lateribus utroque latere c. 12, prominentibus, gracilibus, fere rectis, angulo acuto adscendentibus, prope marginem arcuato-conjunctis, nervulis prominentibus arcte reticulatis; pedunculi gemini 4 mm. longi dense pilosi; involucrum bilobum, lobis 2 mm. longis rotundatis extus adpresso-pilosis; receptaculum oblongo-ovoideum, 1.5-2 cm. longum, 1 cm. latum, apice late rotundatum, basi obtusum, ubique densissime fulvo-hirsutum, ostiolo paullo elevato minuto.—Honduras: In wet forest on the hills above Lancetilla Valley, near Tela, Dept.

Atlántida, alt. 200 m., December 8, 1927, Paul C. Standley 52688 (Herb Field Mus. No. 582,763, type). Also No. 54442 (sterile) from the same locality.

From all the species of *Ficus* known from Central America this is easily separated by the shape of the fruit and its dense spreading pubescence.

Cecropia hondurensis, sp. nov.—Arbor 4.5-15-metralis pauciramosa, cortice albido; folia longe petiolata, peltata, petiolo 20-30 cm. longo, dense breviterque hirsuto vel hirtello, subtereti, striato; lamina 30-50 cm lata et ultra, membranacea, ad medium c. 8-loba, lobis late oblongis vel ovalibus, apice rotundatis vel obtusis, sinubus angustis separatis, supra viridis, pilulis albidis hispidula, subtus minute arachnoideo-pilosa, albida, ad nervulos dense hispidula; inflorescentia mascula ante anthesin bractea 8.5 cm. longa apice acuminata scabra et hispidula inclusa, pedunculo 11 cm. longo gracili striato sparse puberulo, spicis numerosis umbellatis 5-7 cm. longis et 3 mm. crassis 1 cm. longe pedunculatis; inflorescentiae femineae 8-9 cm. longe pedunculatae, pedunculo breviter hirtello, spicis fere sessilibus, 3-4 mm. tantum longe pedunculatis, crassis, paucis, 8-10 cm. longis, fere 1 cm. latis, griseo-viridibus—Honduras: In wet thicket near Tela, Dept. Atlántida, at sea level, January 13, 1928, Paul C. Standley 54528 (Herb Field Mus. No. 583,440, type). Lancetilla Valley near Tela, Standley 56637

“Guarumo.” It is rather futile to describe new species of *Cecropia* when so little is known about those already described, but this common tree of the Lancetilla region does not agree with any of the species known from Central America. This Honduran form is related to *C. longipes* Pittier, of Panama, but in that the pistillate spikes are borne on peduncles 1-1.5 cm. long. More ample material of the Cecropias is badly needed in our herbaria. When it has been assembled, probably the number of species will be greatly increased. I have avoided making specimens of them myself for the same reasons as other collectors—because it is difficult to obtain fertile material, and the innumerable ants which infest the trees make the work of obtaining the material extremely disagreeable.

Trophis chorizantha, sp. nov.—Arbor 9-metralis, ramulis gracilis subteretibus pallide cinnamomeis sparse et minute puberulis vel glabratibus, vetustioribus lenticellatis; stipulae parvae subulatae c. 1.5 mm. longae deciduae; folia alterna, breviter petiolata, petiolo gracili subtereti 5-7 mm longo sparse puberulo vel glabro supra anguste et profunde sulcato; lamina crasse papyracea, oblonga vel obovato-oblonga, 9-15 cm. longa, 3.5-5 cm. lata, abrupte cuspidato-acuminata, acumine 1-2 cm. longo attenuato acuto, basi acuta vel subobtusa, utrinque glabra, supra viridis, costa nervisque non

elevatis, nervulis prominulis, subtus pallidior, laevis, costa gracili elevata, nervis lateralibus utroque latere c. 8, gracilibus, elevatis, angulo lato divergentibus, subarcuatis, inaequalibus, remote a margine laxe conjunctis, nervulis prominulis et arcte reticulatis; spicae femineae 1 cm. longe pedunculatae, 7.5 cm. longae, rhachi subflexuosa, dense puberula, remote pauciflora, floribus sessilibus, solitariis; perianthium urceolatum 2 mm. longum dense adpresso-pilosulum; styli 3-3.5 mm. longi graciles densissime minuteque albido-pilosuli; fructus globosus 5-6 mm. longus sparse minuteque pilosulus.—Honduras: In wet forest, Lancetilla Valley near Tela, Dept. Atlántida, alt. 600 m., March 13, 1928, Paul C. Standley 56771 (Herb. Field Mus. No. 581,798, type).

A near relative of *T. racemosa* (L.) Urban, but that species is distinguished easily by its very rough leaves and dense fruiting spikes.

POLYGONACEAE

Coccocloba hirsuta, sp. nov.—Ramuli teretes crassi dense hirsuti; ocreae 1-1.5 cm. longae subadpressae truncatae hirsutae; petioli crassi, 4-8 cm. longi, dense fulvo-hirsuti; lamina oblongo-ovalis vel elliptico-obovata, 39-52 cm. longa, 17-28 cm. lata, apice abrupte breviterque acuminata, acumine obtuso, basi rotundata vel breviter cordata, subcoriacea vel pergamentacea, supra viridis, subdense hirsuta, nervis prominulis, subtus pallidior, praesertim ad nervos dense fulvo-hirsuta, costa valida elevata, nervis lateralibus utroque latere c. 11, angulo acuto adscendentibus, fere rectis, prominentibus, prope marginem conjunctis, nervulis prominulis laxe reticulatis.—Honduras: Lancetilla Valley near Tela, Dept. Atlántida, alt. about 400 m., January 20, 1928, Paul C. Standley 54802 (Herb. Field Mus. No. 583,474, type). Also No. 52823 from the same locality.

Although obviously it is not desirable to base new species upon sterile material, the present plant is so different from all the other *Coccoclobas* known from Central America that it is evidently a well-marked species. It is easily recognizable by the copious long pubescence of the leaves.

Coccocloba anisophylla, sp. nov.—Arbor 3-6-metralis, ramulis gracilibus teretibus, griseis vel ochraceis, plus minusve rugulosis, novellis dense et minute ferrugineo-puberulis; ocreae truncatae persistentes, 3-5 mm. longae, ferrugineo-puberulae; folia fere sessilia, petiolo 2-6 mm. longo puberulo; lamina oblongo-obovata, 13-30 cm. longa, 5.5-13 cm. lata, crasse membranacea, subabrupte acuminata, acumine angusto attenuato saepe falcato, basin versus angustata, basi solemniter inaequali, latere exteriore rotundata et semicordata, latere interiore anguste rotundata, supra viridis, glabra, nervis prominentibus, subtus pallidior, glabra vel ad costam

minute puberula, costa gracili elevata, nervis lateralibus utroque latere c. 16, gracilibus, prominentibus, angulo acuto adscendentibus, subarcuatis, prope marginem conjunctis, nervulis prominulis laxe reticulatis; flores et fructus ignoti.—Honduras: Lancetilla Valley near Tela, Dept. Atlántida, alt. 100 m., December 18, 1927, Paul C. Standley 53260 (Herb. Field Mus. No. 582,650, type). Also Nos. 53364 and 54840 from the same locality.

This tree, likewise, is known only from sterile material, but the form of the leaves is quite different from that of any other Central American species.

Coccoloba Wercklei, sp. nov.—Arbor mediocris vel parva omnino glabra; ocreae tenues usque ad 1.5 cm. longae; petioli graciles 1.5-2 cm. longi; lamina suborbicularis vel rotundato-ovalis, 7.5-10 cm. longa, 7-9 cm. lata, apice rotundata et breviter protracta, acumine trianguli obtuso, basi cordata, sinu lato vel angusto, membranacea, concolor, nervis supra prominulis, costa subtus elevata gracili, nervis lateralibus utroque latere c. 9, gracillimis, prominentibus, angulo acuto latove adscendentibus, nervulis inconspicuis; racemi terminales, breves, 4-5 cm. longi, pedicellis solitariis gracilibus 9-12 mm. longis; fructus ovoideus, c. 1 cm. longus, niger, edulis, tubo accrescente perianthii inclusus, pulpa violacea acida.—Costa Rica: El Coyolar, alt. 150 m., January, 1912, C. Wercklé (U. S. Nat. Herb. No. 865,109, type).

“Carro caliente.” A relative of the Honduran *C. Browniana* Standl., but in the latter the pedicels are only 5 mm. long.

NYCTAGINACEAE

Neea acuminatissima, sp. nov.—Frutex 1-2-metralis pauciramosus, ramulis validis subteretibus sordide ochraceis glabris sparse lenticellatis; folia opposita, magna, breviter petiolata, petiolo valido 0.7-1.5 cm. longo glabro; lamina crasse membranacea, oblonga, lanceolato-oblonga, oblanceolato-oblonga vel elliptico-oblonga, 20-38 cm. longa, 6-12 cm. lata, apice longissime acuminata, acumine saepe fere lineari et usque ad 7 cm. longo, longe attenuato, basin versus longe sensimque angustata, basi ipsa plerumque solemniter inaequali, glabra, supra viridis, subtus paullo pallidior, costa gracili elevata, nervis lateralibus utroque latere c. 18, angulo lato divergentibus, leviter arcuatis, gracillimis, prominentibus, prope marginem conjunctis, nervulis inconspicuis vix prominulis laxissime reticulatis; inflorescentia feminea terminalis cymoso-paniculata, laxe pauciflora, 2.5-5 cm. longa et aequilata, ramis paucis brevibus divaricatis glabris vel sparse minuteque puberulis, pedicellis crassis 3-4 mm. longis; bracteae lineari-subulatae vel fere filiformes, 3-5 mm. longae, glabrae, persistentes; anthocarpium 12-16 mm. longum, lanceolato-oblongum, obscure et tenuiter costatum, glabrum, apicem versus

acuminatum, basi rotundatum.—Honduras: In wet thicket, Lancetilla Valley near Tela, Dept. Atlántida, alt. 100 m., February 9, 1928, Paul C. Standley 55794 (Herb. Field Mus. No. 581,056, type). Also, from the same region, Nos. 53968a, 54314, 54686, 53215, 56747.

The fruits are pinkish white, red, reddish green, or dark purplish, but it is probable that at maturity they are black. This shrub resembles *N. urophylla* Standl., of Panama, but the latter has much broader, abruptly caudate-acuminate leaves. The only other *Neea* growing about Tela is *N. psychotrioides* Donn. Smith, which has small leaves and fruits. The leaves of *N. acuminatissima* are remarkable for their exceedingly long and narrow acuminations.

MENISPERMACEAE

Disciphania calocarpa, sp. nov.—Frutex alte scandens, ramis inferne nudis, cortice suberosa crassa profunde sulcata grisea obtectis, novellis gracillimis striatis glabris; folia longissime petiolata, petiolo gracili plerumque 9-12 cm. longo striato glabro; lamina 2.5-4 cm. supra basin peltata, late ovata vel elliptico-ovata, 11.5-16.5 cm. longa, 7-10.5 cm. lata, acuta vel abrupte acuta, acumine obtuso, basi late rotundata, papyracea, glabra, supra viridis, lucida, nervis pallidis prominulis, subtus vix pallidior, nervis prominentibus; spicae femineae e ramis vetustioribus nudis nascentes, graciliter longipedunculatae, pedunculo c. 6 cm. longo, rhachi 25 cm. longa et ultra, remotiflora, glabra; fructus ovalis, c. 2 cm. longus, ruber, glaber, basi et apice rotundatus; endocarpium compressum, rotundato-ellipticum, 1.5-1.8 cm. longum, 1-1.5 cm. latum, basi et apice obtusum vel acutiusculum, dorso longitrorsum 3-costatum, marginibus tenuibus.—Honduras: In wet forest, Lancetilla Valley near Tela, Dept. Atlántida, alt. 40 meters, December 10, 1927, Paul C. Standley 52817 (Herb. Field Mus. No. 582,553, type). Lancetilla Valley, Standley 54128.

The genus *Disciphania* has not been reported previously from Central America, the other species being South American and chiefly Brazilian. The Honduras plant is closely related to *D. peltata* (Schum.) Diels, of Brazil, which differs in its short petioles, 2-2.5 cm. long, small leaves, and axillary inflorescences.

Hyperbaena hondurensis, sp. nov.—Frutex parvus scandens, ramulis gracilibus, teretibus, striatis, brunneis vel olivaceis, novellis puberulis vel pilosulis; petioli elongati, graciles, 4-9 cm. longi, striati, puberuli, apice paulo incrassati; lamina papyracea, oblonga, oblongo-ovata vel ovata, 9-23 cm. longa, 4-14.5 cm. lata, abrupte acuta vel acuminata, acumine obtuso, basi rotundata vel interdum truncata, supra viridis, glabra vel ad costam paulo puberula, costa

impressa, nervis prominentibus, subtus vix pallidior, ad nervos puberula vel glabrata, basi 5-nervia, costa gracili elevata, utroque latere pares 2-3 nervorum lateralium emittente, nervulis prominentibus subparallelis reticulato-conjunctis; flores et fructus ignoti.—Honduras: In wet thicket, Lancetilla Valley near Tela, Dept Atlántida, altitude about 50 meters, January 28, 1928, Paul C. Standley 55220 (Herb. Field Mus. No. 584,007, type). Lancetilla Valley, Standley 54004, 53179, 52765, 54641. Near Tela, Standley 54293.

The plant is common in the Lancetilla region, growing in wet forest or thickets, but I was unable to find any plants with either flowers or fruits, and this is generally the case with plants of this genus in the forests of Central America. *Hyperbaena hondurensis* is related to *H. panamensis* Standl., of Panama, but in the latter the petioles are only 1-2.5 cm. long and the venation of the leaves is conspicuously different.

MONIMIACEAE

Mollinedia Butleriana, sp. nov.—Frutex vel arbor 3-6-metralis, sparse ramosa, ramis teretibus gracilibus, novellis dense pilulis minutis patulis pubescentibus, internodiis elongatis; petioli crassi 10-13 mm. longi, dense velutino-pilosuli; lamina pergamentacea, magna, ovalis vel late ovali-elliptica, rarius oblongo-elliptica, 15-24 cm. longa, 8-15.5 cm. lata, apice obtusa vel saepius rotundata et apiculata, basi subacuta vel late obtusa, integra vel remote et obscure undulato-serrulata, supra viridis, scaberula vel fere glabra, nervis non elevatis, subtus pallidior, ubique sed prasertim ad nervos pilis minutis patulis subvelutino-pubescentibus, costa gracili elevata, nervis lateralibus utroque latere c. 5, angulo lato adscendentibus, fere rectis, prominentibus, remote a margine arcuato-conjunctis, nervulis prominulis laxe reticulatis; flores umbellati, pedunculis solitariis vel fasciculatis, 6-10 mm. longis, patent-pilosulis, 1-3-floris, pedicellis 2-3 mm. longis; calyx obovoideus 4.5 mm. longus, dense breviterque pilosulus, parte libera sepalorum late rotundata, vix 1 mm. longa; drupae numerosae sessiles subglobosae, 4-5 mm. longae, sparse et minute pilosulae, virides, apice rotundatae.—Honduras: In wet forest, Lancetilla Valley near Tela, Dept. Atlántida, alt. 500 m., March 13, 1928, Paul C. Standley 56770 (Herb. Field Mus. No. 581,952, type). Nos. 52712, 54688, and 55296, from the hills about Lancetilla, represent the same species.

Mollinedia Butleriana is closely related to *M. guatemalensis* Perk., of Guatemala and British Honduras, but in the latter the leaves are much smaller and narrower, and the pubescence of all parts is closely appressed, rather than spreading. The shrub is common in the wet dense forest at all elevations on the hills about Lancetilla.

The species is named for Mr. Alfred F. Butler, of the Lancetilla Experiment Station, to whom the writer is indebted for innumerable courtesies which helped to make his work in the Lancetilla Valley extremely pleasant.

Connarus Popenoei, sp. nov.—Frutex alte scandens, ramulis gracilibus teretibus griseis striatis, novellis dense villoso-tomentosis; petioli graciles 7-9.5 cm. longi, teretes, ferrugineo-tomentosi vel glabri, rhachi folii 5-10 mm. longa; foliola 3, petiolulo 2-3 mm. longo crasso dense tomentoso; lamina elliptico-oblonga vel obovato-oblonga, 11-22 cm. longa, 4-10 cm. lata, apice obtusa vel breviter et abrupte obtuso-acuminata, basin versus angustata, basi ipsa obtusa, supra glabra, costa elevata, nervis subimpressis, subtus paullo pallidior, ad nervos sparse adpresso-pilosa vel fere glabra, costa gracili elevata, nervis lateralibus utroque latere c. 6, prominentibus, angulo acuto adscendentibus, irregularibus, remote a margine conjunctis, nervulis prominulis laxe reticulatis; inflorescentiae novellae dense ferrugineo-tomentosae, racemis fructiferis 11-20 cm. longis, gracilibus, paniculatis vel ad axillas fasciculatis, tomentosis, floribus subsessilibus; calyx persistens, lacinias oblongis acutis tomentosis vel glabratibus; petala persistentia calyce paullo longiora; folliculus valde obliquus, 4-5 mm. longe stipitatus, 2-2.4 cm. longus, 1.5 cm. latus, conspicue striatus, brunneo-ruber, dense ferrugineo-tomentosus vel glabratus.—Honduras: Wet forest, Lancetilla Valley near Tela, Dept. Atlántida, altitude about 25 meters, January 5, 1928, Paul C. Standley 54130 (Herb. Field Mus. No. 583,960, type). Lancetilla Valley, Standley 53352, 55276.

Related to *C. Lamberti* (DC.) Britton, which occurs in Guatemala, but in that the follicles are nearly sessile and much smaller, and the leaflets average smaller and are less conspicuously veined.

LEGUMINOSAE

Inga belizensis, sp. nov.—Arbor 12-metralis, trunco 15 cm. diam., ramulis gracilibus ochraceis rimosis, novellis puberulis; folia parva, breviter petiolata, rhachi 3-4 cm. longa, minute puberula vel glabrata, angustissime alata, glandulis parvis crateriformibus inter foliola instructa; foliola 3-juga, subsessilia, lanceolato-oblonga vel oblanceolato-oblonga, rarius obovato-oblonga, 5.5-8 cm. longa, 2-3.3 cm. lata, abrupte acuminata, acumine angusto vel lato, obtuso vel acuto, interdum falcato, basin versus cuneatim angustata, subcoriacea, glabra vel in statu juvenili sparse minuteque puberula, costa utrinque prominula, nervis non elevatis; flores spicati, spicis in axillis fasciculatis, 1-2 cm longis, dense multifloris, capituliformibus, graciliter 1.5-3.5 cm. longe pedunculatis, pedunculis minute puberulis, floribus sessilibus, bracteis minutis calyce brevioribus; calyx minute puberulus, 1-1.3 mm. longus, minute 5-dentatus; corolla 5 mm. longa, glabra vel apice tantum puberula, tubo gracili

superne dilatato, lobis oblongis acutiusculis 1.5 mm. longis; stamina alba, c. 12 mm. longa.—British Honduras: Mullins River road, February 22, 1929, William A. Schipp 24 (Herb. Field Mus. No. 588,325, type).

Acacia telensis, sp. nov.—Frutex interdum scandens, ramulis crassis, subteretibus, viridibus, glabris, aculeis gracilibus recurvis 1-3 mm. longis dense armatis, interdum aculeis compressis basi valde dilatatis et 10-14 mm. latis 6-9 mm. longis ochraceis lucidis obsitis; folia magna, 15-20 cm. longa, 1.5-7 cm. longe petiolata, rhachi 12-20 cm. longa, aculeata, angulata, minute puberula vel glabrata, inter pinnas glandulitis depressis instructa, petiolo glandulitis 2 depressis instructo; pinnae c. 11-jugae, 5.5-9 cm. longae, foliolis c. 27-jugis, linear-i-oblongis, 6-12 mm. longis, 1.5-2 mm. latis, glabris, membranaceis, obtusis vel acutiusculis, basi truncatis vel obtusis et obliquis, subtus pallidioribus, nervis non elevatis; legumen late lineare, 12-18 cm. longum, 2 cm. latum, apice obtusum vel rotundatum et breviter apiculatum, basin versus attenuatum, glabrum, 7-11-spermum; semina orbicularia, 6 mm. lata, compressa, castanea, lucida.—Honduras: Wet thicket, Lancetilla Valley near Tela, Dept. Atlántida, alt. 75 m., December 9, 1927, Paul C. Standley 52738 (Herb. Field Mus. No. 582,322, type). Also No. 54453 from the same locality.

The available material is poor, consisting only of leafy branches with detached fruits, but no better specimens could be found. The affinities of the proposed species are, of course, uncertain, but Dr. Britton states that the plant is unknown to him, and it is, therefore, probably new.

Pithecolobium Tonduzii (Britt. & Rose), comb. nov. *Cojoba Tonduzii* Britt. & Rose, N. Amer. Fl. 23: 30. 1928.

Pithecolobium leucocalyx (Britt. & Rose), comb. nov. *Samanea leucocalyx* Britt. & Rose, N. Amer. Fl. 23: 34. 1928.

Pithecolobium guatemalense (Britt. & Rose), comb. nov. *Chloroleucon guatemalense* Britt. & Rose, Trop. Woods 10: 24. 1927.

Pithecolobium Langlassei (Britt. & Rose), comb. nov. *Chloroleucon Langlassei* Britt. & Rose, N Amer Fl 23: 38. 1928.

Calliandra Rekoi (Britt. & Rose), comb. nov. *Anneslia Rekoi* Britt. & Rose, N Amer. Fl. 23: 53. 1928.

Calliandra splendens (Britt. & Rose), comb. nov. *Anneslia splendens* Britt. & Rose, N. Amer. Fl. 23: 53. 1928.

Calliandra tergemina (L.), comb. nov. *Mimosa tergemina* L. Sp. Pl. 517. 1753. *Anneslia tergemina* Britt. & Rose, N. Amer. Fl. 23: 53. 1928.

Calliandra yucatanensis (Britt. & Rose), comb. nov. *Anneslia yucatanensis* Britt. & Rose, N. Amer. Fl. 23: 53. 1928.

Calliandra Deamii (Britt. & Rose), comb. nov. *Anneslia Deamii* Britt. & Rose, N. Amer. Fl. 23: 56. 1928.

Calliandra pubiflora (Britt. & Rose), comb. nov. *Anneslia pubiflora* Britt. & Rose, N. Amer. Fl. 23: 58. 1928.

Calliandra speciosa (Mart. & Gal.), comb. nov. *Inga speciosa* Mart. & Gal. Bull. Acad. Brux. 10²: 320. 1843.

Calliandra Tonduzii (Britt. & Rose), comb. nov. *Anneslia Tonduzii* Britt. & Rose, N. Amer. Fl. 23: 61. 1928.

Calliandra rubescens (Mart. & Gal.), comb. nov. *Acacia rubescens* Mart. & Gal. Bull. Acad. Brux. 10²: 315. 1843. *Anneslia rubescens* Britt. & Rose, N. Amer. Fl. 23: 61. 1928.

Calliandra belizensis (Britt. & Rose), comb. nov. *Anneslia belizensis* Britt. & Rose; Standl. Trop. Woods 11: 19. 1927.

Calliandra mollicula (Mart. & Gal.), comb. nov. *Acacia mollicula* Mart. & Gal. Bull. Acad. Brux. 10²: 313. 1843. *C. malacophylla* Benth. Lond. Journ. Bot. 3: 100. 1844.

Calliandra media (Mart. & Gal.), comb. nov. *Acacia media* Mart. & Gal. Bull. Acad. Brux. 10²: 316. 1843. *C. angelica* Benth. Lond. Journ. Bot. 3: 100. 1844.

Calliandra gracilis (Mart. & Gal.), comb. nov. *Acacia gracilis* Mart. & Gal. Bull. Acad. Brux. 10²: 311. 1843.

Calliandra Callistemon (Schlecht.), comb. nov. *Acacia Callistemon* Schlecht. Linnaea 12: 568. 1838.

Calliandra yoroensis (Britton), comb. nov. *Anneslia yoroensis* Britton, N. Amer. Fl. 23: 193. 1928.

Acacia sesquijuga (Britt. & Rose), comb. nov. *Acaciopsis sesquijuga* Britt. & Rose, N. Amer. Fl. 23: 95. 1928.

Erythrina hondurensis, sp. nov.—Frutex vel arbor 3-6-metralis, ramulis crassis, ochraceis, glabratiss, dense aculeatis, aculeis 5-8 mm.

longis et ultra, compressis, basi dilatatis, ochraceis vel stramineis; folia magna, 20-27 cm. longe petiolata, rhachi 6-7 cm. longa, gracili, dense tomentosa vel glabrata, petiolulis 5-17 mm. longis; foliola membranacea, terminale deltoideum vel late rhombicum, 14-21 cm. longum et 12-19 cm. latum, abrupte longiacuminatum, acumine angusto, attenuato, basi truncatum vel late obtusum, foliola lateralia angustiora et paulo minora, basi valde obliqua, omnia primo supra pilis longis mollibus sordidis dense pilosa, mox glabrata, viridia, subtus pallida, dense adpresso-pilosa, serius fere glabra, inermia, interdum glaucescentia; racemi densi, multiflori, c. 11 cm. longi et 7 cm. longe pedunculati, rhachi dense tomentosa, crassa, pedicellis crassis 3-5 mm. longis tomentosis; calyx tubulosus, superne paulo dilatatus, 1.5 cm. longus, dense tomentosus vel serius glabratius, basi obtusus, apice 6-7 mm. latus, truncatus vel uno latere brevissime fissus; corolla coccinea, glabra, vexillo 7-7.5 cm. longo, obtuso, c. 1 cm. lato, alis et petalis carinalibus calyce brevioribus; stamina 5-6 cm. longa, glabra; ovarium graciliter stipitatum, dense tomentosum; legumen 4.5 cm. longe stipitatum, c. 16 cm. longum et 1.5 cm. latum, dense tomentosum vel glabratum, inter semina valde constrictum, c. 7-spermum; semina coccinea, 12 mm. longa, 8 mm. lata.—Honduras: In wet thicket, Lancetilla Valley near Tela, Dept. Atlántida, alt. 100 m., January 12, 1928, Paul C. Standley 54411 (Herb. Field Mus. No. 583,771, type). Also Nos. 52757 and 55504 from the same locality.

“Pito.” Flowers scarlet or fiery red and very showy. The tree blooms when nearly or quite devoid of leaves.

A relative of *E. costaricensis* Micheli, of Costa Rica and Panama, but differing from that species in the loose tomentum which invests all parts during anthesis, and in the shorter calyx and corolla.

Diocea Wilsonii, sp. nov.—Frutex magnus sc. ndens, ramis terebibus dense pilis 3-5 mm. longis rigidis ferrugineis patentibus hirsutis; stipulae persistentes, anguste lanceolatae, 9-15 cm. longae, basi infra insertionem in auriculam fere aequilongam protractae, dense hirsutae, longe attenuatae; petiolus 5.5-7.5 cm. longus, hirsutus, rhachi 2.5-3 cm. longa; foliola 5-7 mm. longe petiolulata, ovalia vel ovari-elliptica, 8-17 cm. longa, 5-10 cm. lata, subcoriacea, apice rotundata et abrupte breviterque apiculata vel acuminata, basi rotundata, lateralia paulo obliqua, supra viridia, lucida, praesertim ad nervos hirtella vel hirsuta, aliter glabrata, nervis nervulisque prominulis, subtus pallidiora, ubique pilis brevibus patentibus saepe ferrugineis hirsuta, costa gracili elevata, nervis lateralibus utroque latere c. 8, angulo acuto adscendentibus, gracilibus, subarcuatis, prope marginem conjunctis, nervulis prominulis et reticulatis; racemi 8-24 cm. longi, 10-18 cm. longe pedunculati, dense multiflori, rhachi pilis brevibus adscendentibus vel subadpressis saepe nigrescentibus vel ferrugineis dense induta; bracteae deciduae, anguste lineares, patentes vel adscendentes, 1-1.5 cm. longae, attenuatae,

dense adpresso-hirsutae; flores ad nodos fasciculati, subsessiles; bracteolae late ovatae, 2-2.5 mm. longae, mucronatae; calyx 3" mm. longus, dense adpresso-pilosulus et ciliatus, labio superiore late rotundato; corolla in alabastro 5 mm. longa, vexillo extus dense strigoso.—Honduras: Point Triunfo, near Tela, February 6, 1903, *Percy Wilson* 336 (Herb. Field Mus. No. 186,054, type). Wet thicket, Lancetilla Valley, near Tela, Dept. Atlántida, *Standley* 55568 (sterile). Guatemala: Los Amates, Dept. Yzabal, in 1908, *Kellerman* 7478.

The species is noteworthy for the abundant long harsh pubescence.

Dalbergia Calderonii, sp. nov.—Arbor 4-metralis, ramulis gracilibus ochraceis rimosis, novellis dense puberulis; folia 12-16 cm. longa, 2-3 cm. longe petiolata, rhachi 5.5-7 cm. longa, gracili, subtereti, minute pilosula; foliola c. 5, 3-5 mm. longe petiolulata, crasse membranacea, ovata vel ovato-oblonga, 4.5-8.5 cm. longa, 2-3.5 cm. lata, versus apicem obtusum sensim angustata, minute apiculata, basi obtusa vel rotundata, supra lucida, sparse puberula vel fere glabra, nervis prominulis, subtus brunnescentia, ubique incurvo-puberula, ad costam pilosula, costa nervisque gracilibus prominentibus, nervulis prominulis arce reticulatis; paniculae axillares, fructiferae 6-8 cm. longae, laxe pauciflorae, breviter pedunculatae, pedicellis brevibus; legumen oblongum, tenuie, 5-5.5 cm. longum, 1.5-2 cm. latum, apice obtusum vel rotundatum et minute apiculatum, basi acutum et in stipitem 4-6 mm. longum decurrent, 1-spermum, ubique densissime velutino-pilosulum.—Salvador: La Reina, Dept. Chalatenango, in 1928, *Salvador Calderón* 2654 (Herb. Field Mus. No. 580,410, type).

Lonchocarpus monospermus, sp. nov.—Arbor 4.5-9-metralis, ramulis fusco-ferrugineis vel fusco-griseis, striatis, elevato-lenticellatis; folia alterna, 20-26 cm. longa, 4.5-5.5 cm. longe petiolata, rhachi 4-8 cm. longa, gracili, dense et minutissime adpresso-pilosula; foliola 5-7, 5-6 mm. longe petiolulata, subcoriacea, oblonga, ovalia, vel terminalia obovata, 6-14 cm. longa, 3-7 cm. lata, apice acuta vel rotundata et abrupte breviterque apiculata, basi obtusa vel rotundata vel in foliolis terminalibus acuta, supra glauco-viridia, praesertim ad nervos minute adpresso-pilosula, nervis interdum prominulis, subtus glauca, minutissime puberula, costa nervisque gracilibus prominentibus, nervulis prominulis arce reticulatis; racemi axillares, solitarii, 8-10 cm. longi, 3-5.5 cm. longe pedunculati, dense multiflori, rhachi minutissime adpresso-pilosula, pedicellis fructiferis crassis 2-5 mm. longis; fructus valde compressus, late ovali-ellipticus vel interdum subrotundatus, 2.5-3.5 cm. longus, 1.5-2 cm. latus, ochraceus, apice abrupte acuminate vel rotundatus et longe mucronatus, basi subrotundatus et abrupte in stipitem brevem contractus, ubique densissime et minute adpresso-pilosus, marginibus tenuibus; semina reniformia, valde compressa, ferrugineo-brunnea, 14 mm. longa, laevia, lucida.—Honduras: In wooded swamp near Tela, Dept. Atlántida,

at sea level, December 27, 1927, *Paul C. Standley 53715* (Herb. Field Mus. No. 583,044, type). Also No. 53599 from the same locality.

The tree is plentiful in the swamps about Tela. The species is easily recognized by its small one-seeded pods.

EUPHORBIACEAE

Acalypha lancetillae, sp. nov.—Frutex 2.5-3.5 m. altus, gracilis, ramulis densissime pilis brevibus pallidis patentibus mollibus pilosis, vetustioribus teretibus pallide cinnamomeis rimosis et sparse lenticellatis, internodiis brevibus vel elongatis; stipulae 7 mm. longae, setaceae, persistentes, puberulaceae; petioli 0.5-2 cm. longi, graciles, densissime pilosi; lamina membranacea, oblonga vel obovato-oblonga, 7-17 cm. longa, 3-7 cm. lata, longe acuminata, acumine angusto acuto vel obtuso, basin versus paulo vel longe cuneatimque angustata, basi ipsa obtusa, rotundata vel breviter cordata, arcte serrata, serraturis parvis adpressis, supra viridis, ubique hirsuta vel hirtella vel inter nervos glabrata, costa nervisque prominulis, subtus paulo pallidior, ubique dense pilis brevibus patentibus velutino-pilosa, penninervia, costa gracili elevata, nervis lateralibus utroque latere c. 11, gracilibus, prominentibus, angulo lato adscendentibus, juxta marginem anastomosantibus, nervulis transversis rectis vel undulatis subparallelis conjunctis; flores monoici; spicae masculae densiflorae graciles axillares subsessiles plerumque 5-8 cm. longae 2 mm. crassae; bracteae femineae ut videtur in axillis solitariae et sessiles vel subsessiles, profunde laciniatae, dense pilosae; styli c. 6 mm. longi, pinnatim multilacinuligeri.—Honduras: In wet forest high on the hills above Lancetilla Valley, near Tela, Atlántida, alt. 600 m., March 13, 1928, *Paul C. Standley 56782* (Herb. Field Mus. No. 581,788, type). Also No. 56806 from the same locality.

The inflorescences are so immature that it is impossible to determine the exact nature of the pistillate bracts, whose character is so important in segregating the species of this genus. In the shape of the leaves this species somewhat suggests *A. costaricensis* (Kuntze) Knobl., although it is not closely related to that. Its true position within the genus must remain uncertain until better material has been collected.

Dalechampia laevigata, sp. nov.—Volubilis, herbacea; caules gracillimi, breviter albido-pubescentes, ultimi fere filiformes; stipulae virides, lineari-lanceolatae, 4-6 mm. longae; petiolus 2-6.5 cm. longus, gracilis, albido-pubescentes vel glabratius; lamina ovata, late ovata vel oblongo-ovata, 7-16 cm. longa, 3.5-10 cm. lata, obtusa et apiculata vel acuta vel acuminata, basi truncata vel saepius breviter vel usque ad 1.5 cm. profunde cordata, 3-5-nervia, obsolete remoteque serrulata vel subintegra, crasse membranacea, supra glauco-viridis,

ad nervos minute puberula, costa nervisque prominentibus, subtus fere concolor, ad nervos minute pilosula, inter nervulos minutissime sparseque strigillosa, costa gracili elevata, utrinque nervos c. 4 angulo acuto adscendentibus emittente, nervulis prominentibus arcte reticulatis; inflorescentiae pedunculatae, bracteis involucralibus viridibus membranaceis, inaequalibus, latissime rotundato-ovatis, c. 2 cm. longis et 3 cm. latis, obtusis vel latissime obtusis, basi truncatis vel obtusissimis, repando-denticulatis, fere glabris; sepala floris feminei c. 7, pinnatim partita, parte rhachiali linearis, lacinulis numerosis linearibus patentibus dense hispidis, sub fructu 1 cm. longis et ultra; ovarium dense puberulum; columna stylaris filiformis, apice paulo dilatata; capsula depresso-globosa, profunde triloba, minute puberula, 1 cm. lata; semina globosa, 4 mm. diam., laevia, brunnescentia.—Honduras: In wet thicket, Lancetilla Valley near Tela, Dept. Atlántida, alt. 100 m., December 23, 1927, Paul C. Standley 53531 (Herb. Field Mus. No. 583,076, type). Also from the same locality, Nos. 53850, 54652, 54135, 55271, 56651.

A relative of *D. Schottii* Greenm., of Yucatan, but the latter differs in its densely pubescent leaves and much smaller bracts.

Euphorbia amphimalaca, sp. nov.—*Herba adscendens, caulis elongatis usque ad 1 m. longis et ultra, dense pilis albidis mollibus multicellularibus patentibus villosis, internodiis elongatis; folia alterna, longe petiolata vel supra subsessilia, petiolo vulgo 7-20 mm. longo, dense villosa; lamina membranacea, ovata vel elliptico-ovata, 2.5-6 cm. longa, 1.5-3.5 cm. lata, acuta vel subobtusa, basi obtusa vel rotundata, supra viridis, sparse pilis albidis gracillimis villosa, costa non elevata, nervis obscuris, subtus pallida, dense pilis longis albidis patentibus villosa, costa prominula, nervis lateribus obscuris; inflorescentiae terminales, saepe foliorum verticillo e foliis 3 subsessilibus composito fulcratae, cymosae, pedunculatae, 1-1.5 cm. longae, bracteis minutis vel deciduis; involucra pauca, breviter pedicellata, 1 mm. longa, cyathiformia, adpresse albido-pilosula, glandulis rotundatis c. 0.7 mm. latis, appendicibus petaloideis albis, 1 mm. latis et 0.5 mm. longis, integris, intus glabris.*—Honduras: On moist shaded bank at the base of cliffs along stream, near Siguatepeque, Dept. Comayagua, alt. 1,200 m., February, 1928, Paul C. Standley 56341 (Herb. Field Mus. No. 582,112, type).

A species well marked by the very long and slender stems and by the densely pubescent leaves.

Euphorbia siguatepequensis, sp. nov.—*Herba annua erecta omnino glabra, 6-10 cm. alta, superne ramosa, ramis gracillimis dichotomis adscendentibus; stipulae minutae subulatae vix 0.3 mm. longae; folia opposita, petiolo 1 mm. longo; lamina subcoriacea, enervia, ovata, oblonga vel oblongo-ovata, 4-7 mm. longa, 2-3.5 mm. lata, apice obtusa vel anguste rotundata, basi valde obliqua, uno latere angustata, altero profunde semicordata, obsolete serrulata vel*

fere integra, supra pallide viridis, subtus glaucescens vel purpurascens, costa supra obsoleta, subtus manifesta sed non elevata, marginibus revolutis; involucra pauca, ex axillis supremis nascentia, breviter graciliterque pedicellata, glabra, turbinata, 0.5 mm. longa, pauciflora, appendicibus minutis rotundatis glabris rubicundis; capsula glabra, longe stipitata, 2 mm. lata, breviter triloba; semina ovaliglobosa, 1 mm. longa, laevia, obscure glauco-brunnea.—Honduras: In pine forest, near Siguatepeque, Dept. Comayagua, alt. 1,200 m., February, 1928, Paul C. Standley 56266 (Herb. Field Mus. No. 581,689).

Subgenus *Chamaesyce*. An apparently well-marked form, which does not agree with any description available nor with any of the many species represented by authentic material in the herbarium of Field Museum.

Plukenetia angustifolia, sp. nov.—Frutex volubilis, ramis gracilibus teretibus, novellis incurvo-puberulis, internodiis elongatis; stipulae minutae cito deciduae; folia breviter petiolata, petiolo gracili 6-13 mm. longo albido-puberulo; lamina crasse membranacea, oblonga vel anguste oblonga, 4.5-10 cm. longa, 1.5-4 cm. lata, abrupte acuminata, acumine angusto attenuato acuto vel apiculato, basi obtusa vel rotundata, interdum basin versus cuneatim angustata, remote et brevissime serrulata, supra viridis, ad costam puberula vel fere omnino glabra, costa nervisque prominulis, subtus paullo pallidior, glabra vel ad nervos hinc inde pilosula, basi trinervia, nervis basalibus lateralibus brevibus, nervis lateralibus utroque latere c. 8, angulo lato adscendentibus, gracillimis, subarcuatis, prope marginem arcuato-conjunctis, nervulis prominulis laxe reticulatis; racemi axillares solitarii 2-2.5 cm. longi, breviter pedunculati, graciles, laxe remotiflori, nodis paucifloris, flore femineo solitario e basi racemi nascente, in statu fructifero graciliter 1.5-2 cm. longe pedicellato; pedicellus floris masculi gracilis puberulus 3-6 mm. longus; bracteae minutae virides lanceolatae persistentes; flores masculi in alabastro globosi, per anthesin 4-partiti, extus sparse puberuli; stamina numerosa; capsula depresso-globosa, profunde 4-loba, 1-1.5 cm. lata, glabra, viridis, coccis dorso carinatis, ad medium obtuse tuberculatis, stylo persistente crasso 1.5 mm. longo.—Honduras: In wet thicket, Lancetilla Valley, Dept. Atlántida, alt. 100 m., March 8, 1928, Paul C. Standley 56708 (Herb. Field Mus. No. 581,511, type). Guatemala: Cubilquitz, June, 1901, H. von Tuerckheim 11,372. British Honduras: Big Creek, W. A. Schipp 156.

This curious vine, of rather wide distribution, seems to belong properly enough in the genus *Plukenetia*. It is possible that it may be the same as *P. penninervia* Muell. Arg., which is reported from Venezuela and Mexico (the reference to Mexico, based upon a Pavón specimen is very doubtful), but it disagrees in several respects with the description of that species. The glands at the base

of the leaf blade, which are described for *P. penninervia* as being 1-1.5 mm long, I have not found in the plant here described.

RHAMNACEAE

Gouania eurycarpa, sp. nov.—Frutex 3-4.5 m. altus, ramis elongatis saepe subscendentibus, novellis dense pilosis; petioli 8-12 mm. longi validi, dense fulvo-pilos; lamina elliptica vel ovato-elliptica, 5-8.5 cm. longa, 2.5-5.5 cm lata, acuta vel abrupte acuta, basi obtusa vel rotundata, remote et adpresso serrato-crenata, supra viridis, dense pilosa vel glabrata, subtus paullo pallidior, dense velutino-pilosa, costa et nervis elevatis gracilibus; racemi breves, 6-9 cm. longi, densiflori, dense breviterque pilosi, floribus fere sessilibus; fructus 1.5 cm. latus, 10-12 mm. longus, basi et apice emarginatus, dense velutino-pilosus, alis crassissimis, 5-6 mm. latis.—Honduras: In wet thicket, near Progreso, Dept. Yoro, alt. 30 meters, January 24, 1928, Paul C. Standley 54988 (Herb. Field Mus. No. 583,665, type).

It is quite unexpected to find in Central America a distinct species of this genus, which consists of weedy shrubs. *Gouania eurycarpa* is evidently related to *G. polygama* (Jacq.) Urban, but the fruits are much larger than any I have seen on specimens of that species, and much more densely pubescent. The leaves, also, are more copiously pubescent than is usual in *G. polygama*.

MALVACEAE

Malvaviscus Cuttleri, sp. nov.—Frutex vel arbor parva 1.5-4.5 m. alta, ramulis crassiusculis dense pilis longis albido stellato-pilos; petioli graciles 7-13 cm. longi dense stellato-pilos; lamina magna late ovata vel rotundato-ovata, 20-25 cm. longa et ultra, 13-19 cm. lata, interdum obscure angulata, grosse et inaequaliter dentata, basi breviter cordata, apice sensim vel abrupte longiacuminata, utrinque viridis et pilis longis rigidis stellatis vel tantum furcatis interdum simplicibus sat sense hirsuta, basi 5-7-nervia; flores breviter racemosi, racemis axillaribus pauci- vel multifloris, pedicellis 1-1.5 cm. longis dense stellato-hirsutis; calyx viridis, 1.7-2 cm. longus, stellato-hispidus, lobis anguste triangularibus 7-8 mm. longis sensim acuminatis; bracteolae c. 8 lineares, longe attenuatae, 7-11 mm. longae, dense stellato-hirsutae; corolla pallide rubra extus sparsissime stellato-hispida, petalis 5 cm. longis; columna staminalis 1 cm. longe exserta; fructus c. 1.5 cm. latus depresso-globosus glaber.—Honduras: Wet forest, Lancetilla Valley near Tela, Dept Atlántida, alt. 100 meters, January 5, 1928, Paul C. Standley 54127 (Herb. Field Mus. No. 583,957, type). Lancetilla Valley, in thicket, Standley 52756.

Most of the species of *Malvaviscus* are poorly defined, and it seems altogether impossible to separate them by definite and plau-

sible characters. No two plants, as a rule, are just alike, and all the ordinarily dependable characters used in separating species of Malvaceae seem to fail in this genus. For this reason I had never expected to describe a new species of the group, unless possibly one should be found with blue flowers, pinnate leaves, or some equally outstanding character. The present plant, however, was recognized in the field as being something quite different from anything which I had seen previously in Central America, and comparison in the herbarium shows that it is quite distinct from all the material available for study. The very large leaves alone are sufficient to distinguish it, and the arrangement of the flowers in many-flowered inflorescences, and their dense coarse pubescence, separate the plant definitely. When growing it is far handsomer than most species of the genus, and it is well worthy of introduction into cultivation. It was noted only in the wet forest at the base of the hills above Lancetilla, where it is rather plentiful.

The species is named for Mr. Victor M. Cutter, President of the United Fruit Company, who has always been generous in encouraging botanical and other scientific exploration in Central America.

FLACOURTIACEAE

Xylosma sylvicola, sp. nov.—Frutex vel arbor 2-6-metralis, truncus ramosus armatus, ramulis gracilibus flexuosis glabris lenticellis parvis elevatis conspicue conspersis, vetustioribus ochraceis; folia sparsa breviter petiolata, petiolo gracili 2-5 mm. longo glabro; lamina membranacea, elliptico-oblonga vel elliptica, 6.5-11.5 cm. longa, 2.5-4.5 cm. lata, longe scuminata, acumine angusto saepe falcato integro obtuso vel subemarginato, basi obtusa vel acuta, arcte crenato-serrata, serraturis magnis subadpressis inaequalibus, supra viridis, glabra, nervis prominulis, subtus paullo pallidior, ad nervos minute puberula vel fere omnino glabra, costa gracili elevata, nervis lateribus utroque latere c. 5, gracilibus, prominentibus, angulo acuto adscendentibus, subarcuatis, inaequalibus, remotissime a margine conjunctis, nervulis prominulis laxe reticulatis; flores feminei ad axillas vel ad nodos defoliatos fasciculati, pedicellis 6-10 puberulis 2-2.5 mm. longis; sepala ovata, 0.7-1 mm. longa, obtusa, viridia, minute puberula et ciliata, persistentia; fructus subglobosus, glaber. laevis, 7-8 mm. longus; semina 3, brunnea, 5 mm. longa, nitida.—Honduras: Wet mountain forest above Lancetilla Valley, near Tela, Dept. Atlántida, alt. 200 m., December 12, 1927, Paul C. Standley 52917 (Herb. Field Mus. No. 582,875, type). Also Nos. 54622 and 56884 from the same region. Wet thicket, Tela, at sea level, Standley 56692.

Like most other species of the genus, this has no outstanding characters, but it is scarcely referable to any of the *Xylosmas* described or recorded heretofore from Central America.

Lunania piperoides, sp. nov.—Arbor gracilis 6-9-metralis, trunco cortice laevi pallido obtecto, ramulis gracilibus subflexuosis minute puberulis vel glabratis, novellis stramineis, vetustioribus teretibus ochraceis rimosis, internodiis elongatis; folia alterna, petiolo gracili 1-1.8 cm longo tereti minute puberulo et sparse hirsuto; lamina lanceolato-oblonga vel oblongo-ovata, 9-20 cm. longa, 3.5-8 cm. lata, abrupte sensimve acuminata vel longiacuminata, acumine angusto longe attenuato obtuso, basi obtusa vel subito breviterque contracta, crasse membranacea, supra viridis, glabra, costa subimpressa, nervulis prominulis, subtus fere concolor, ad costam nervosque minute puberula et sparse albido-hirsuta vel glabrata, basi trinervis, costa gracili elevata supra medium costas secundarias utrinque 2-3 emitente, nervulis transversis prominentibus parallelis fere rectis angulo recto e costa abeuntibus, nervulis ultimis prominulis et arcte reticulatis; flores parvi racemosi, racemis 3-5 gracilibus umbellatis vel breviter racemosis, umbellis breviter pedunculatis, racemis 4-7 cm. longis, densifloris, patentibus vel adscentibus, rhachi dense puberula, bracteis minutis, pedicellis plerumque c. 1 mm. longis; sepala oblonga obtusa glabra 1.5-2 mm. longa; stamina 7-10, filamentis 2-3 mm. longis, antheris subglobosis 0.5 mm. longis; fructus subglobosus, glaber, pallide ruber, 5 mm. longus, laevis; semina numerosa, in pulpa nidulanta, ovoidea, 1 mm. longa.—Honduras: In wet forest above Lancestilla Valley near Tela, Dept. Atlántida, alt. 400 m., December 12, 1927, Paul C. Standley 52875 (Herb. Field Mus. No. 582,908, type). Also from the same region, Nos. 54152, 55371, 53869, 53293, 53998, 54420.

Related to *L. mexicana* Brandeg., the only other species known from the North American mainland. In that the leaves are much smaller, and the pubescence consists wholly of minute, almost microscopic hairs.

MYRTACEAE

Eugenia lancilliae, sp. nov.—Arbor 6-metralis, ramis gracilibus brunneis rimosis, novellis dense et minute puberulis; petioli 6-8 mm. longi, crassiusculi, minute brunneo-puberuli; lamina oblonga vel elliptico-oblonga, 13-19 cm. longa, 5.5-7.5 cm. lata, anguste acuminata, acumine obtuso, basi obtusa vel acutiuscula, crasse membranacea, supra viridis, glabra, dense et minute pellucido-punctata, nervis nervulisque prominulis, subtus paullo pallidior, praesertim ad nervos minute puberula vel glabrata, costa gracili elevata, nervis lateralibus utroque latere c. 10, gracilibus, prominentibus, saepe inaequalibus, arcuatis, remote a margine nervum collectivum efformantibus, nervulis prominulis laxe reticulatis; flores in axillis foliorum et ad ramos defoliatos fasciculati, sessiles vel subsessiles;

fructus subglobosus vel ovali-globosus, 12 mm. longus, luteo-viridis, glaber, dense et grosse glandulos-punctatus; semen 1.8 mm. diam., brunneum.—Honduras: Wet forest, Lancetilla Valley near Tela, Dept. Atlántida, alt. 100 meters, December 10, 1927 Paul C. Standley 53301 (Herb. Field Mus. No. 582, 197, type).

The species is not closely related to any other known from Central America, the distinguishing characters being the large, narrow, pubescent leaves and the large subsessile fruits which are produced mostly along the older, leafless branches.

Calyptranthes Calderonii, sp. nov.—Rami graciles teretes ochracei plus minusve rimosi, novellis glabris, internodiis elongatis; folia longius petiolata, petiolo 6-9 mm. longo valido supra sulcato; lamina elliptico-oblonga vel oblongo-lanceolata, 4.5-6 cm. longa, 1-2.3 cm. lata, apicem versus longe attenuata, acumine obtuso, basi acuta, coriacea, utrinque dense et minute puncticulata, supra viridis, glabra, costa impressa, nervis obsoletis, subtus pallidior, sparse adpresso-pilosa vel glabrata, costa gracili elevata, nervis lateralibus utroque latere c. 15, prominulis, gracilibus, angulo acuto adscendentibus, prope marginem nervum collectivum efformantibus; paniculae terminales at axillares, fasciculatae, 3.5-4 cm. longe pedunculatae, laxe pauciflorae, folia superantes, ramis oppositis vel verticillatis, patentibus, rigidis, glabris, floribus plerumque ternatis sessilibus vel brevissime stipitatis; calyx in alabastro ellipsoideus, 2.5 mm. longus, obtusus, glaber, punctatus; flores et fructus non visi.—Salvador: Cerro de Apaneca, in 1928, Salvador Calderón 2423 (Herb. Field Mus. No. 585, 354, type).

Vernacular name, "escobo." A relative of the Mexican species, *C. Schiedeana* Berg and *C. pendula* Berg. The former differs in having much broader leaves and pediceled flowers; the latter in its sericeous buds and shorter petioles. *C. hondurensis* Standl. of Honduras differs in having petioles twice as long or more, and sericeous buds.

MELASTOMACEAE

Conostegia caelestis, sp. nov.—Arbor 7.5-metralis, trunco 10 cm. diam., ramulis gracilibus dense pilis rigidis sordidis patentibus apice minute stellato-penicillatis hispido-hirsutis, pilis minutis sessilibus intermixtis; folia breviter petiolata, petiolo crasso 1-2.5 cm. longo ut ramuli hispido; lamina membranacea, elliptico-oblonga, 9-20 cm. longa, 3.5-7 cm. lata, apice abrupte cuspidato-acuminata, acumine angusto 1-2 cm longo attenuato, basi acuta vel subobtusa, 5-nervia, nervis exterioribus interdum obscuris, supra viridis, pilis brevibus patentibus setoso-hispida, subtus ad nervos pilis stellatis stipitatis hispida, inter nervos pilis sessilibus stellato-hispida, nervis transversis elevatis rectis parallelis angulo lato divergentibus; panicula terminalis subdense pauciflora, c. 5 cm. longa et 4.5 cm. lata,

2.5 cm. longe pedunculata, ramis crassis divaricatis dense stellato-hispidis; calyx in alabastro 8 mm. longus, abrupte acuminatus, densissime stellato-hispidus, parte basali in anthesi 4 mm. longa, late campanulata; petala 6-8, late obovata, reflexa, 5-9 mm. longa, denticulata, glabra; antherae 2.5 mm. longae, filamentis glabris.—British Honduras: Big Creek, Mullins River road, alt. 15 m., March 8, 1929, *William A. Schipp* 63 (Herb. Field Mus. No. 588,330, type).

A well-marked species, notable for the abundant pubescence, consisting of long spreading hairs stellate at the apex, with numerous minute sessile stellate hairs intermixed.

Tococa grandifolia, sp. nov.—Frutex 2-3.5 m. altus, pauci-ramosus, ramis crassis densissime setis longis incrassatis patentibus brunnescentibus indutis; folia breviter petiolata, petiolo crasso 2.5-5 cm. longo, dense setoso; lamina membranacea, magna, late elliptica vel rotundato-elliptica, 23-37 cm. longa, 16-23 cm. lata, et ultra, apice rotundata et abrupte cuspidato-caudata, acumine anguste triangulari c. 2 cm. longo attenuato, basi late rotundata, crebre denticulata vel subintegra, supra glauco-viridis, glabra, subtus ad nervos setoso-hispida et sparse stellato-furfuracea, aliter glabra vel glabrata, 5-nervia, nervis exterioribus tenuissimis, 2 interioribus validioribus, costa crassa elevata, nervis secundariis angulo fere recto abeuntibus, rectis parallelis; paniculae dense multiflorae, 7-14 cm. longae, pyramidales, breviter pedunculatae, ramis dense hispidis, floribus sessilibus dense congestis; calyx furfuraceo-puberulus vel glabratus, turbinateo-cylindricus, 4-5 mm. longus, breviter 5-lobus, lobis late ovatis obtusis; petala pallide rosea, 3-4 mm. longa, glabra obtusa; antherae 4-5 mm. longae; fructus subglobosus, 4-5 mm. diam., purpureo-ruber, glabratus, obscure costatus, 5-locularis.—Honduras: In wet forest, Lancetilla Valley near Tela, Dept. Atlántida, alt. 150 m., December 12, 1927, *Paul C. Standley* 52870 (Herb. Field Mus. No. 582,919, type). Also Nos. 54890 and 54556 from the same locality. Along trail west of Tela River, in 1903, *Wilson* 227.

The last specimen cited was determined as *T. platyphylla* Benth., a species described from Colombia and reported by Cogniaux also from Panama. I have seen no authentic Colombian material, but the Honduran plant differs in so many respects from the descriptions given by Benth and Cogniaux that it does not seem possible that the plants from the two regions can be conspecific. *T. platyphylla* is reported as having leaves only 9-15 cm. wide and merely puberulent beneath on the nerves, and "fere 7-plinervia." The petals also are stated to be 1 cm. long. The plant is described, in addition, as an "herba brevicaulis," a statement certainly not applicable to the Honduran plant.

Miconia habrolepis, sp. nov.—Arbor 9-12-metralis, ramulis crassis subtetragonis et compressis densissime et minute ferrugineo-

lepidotis; folia opposita, breviter petiolata, petiolo crasso 1.5-2.5 cm. longo dense ferrugineo-lepidoto; lamina coriacea, elliptico-oblonga, 12-27 cm. longa, 5-11 cm. lata, apice obtusa vel rotundata et abrupte caudato-cuspidata, acumine angusto saepe fere linearis 1-1.5 cm. longo attenuato, basi saepius acuta vel interdum obtusa vel subrotundata, 3-nervia, supra viridis, glabra, sublucida, nervis subimpresis, subtus ubique densissime et adpresso ferrugineo-lepidota, costa nervisque elevatis, nervulis transversis angulo lato abeuntibus, gracilis, rectis, parallelis, nervulis ultimis impressis; paniculae terminales pyramidales, 10-20 cm. longae, 7-17 cm. latae, laxe multiflorae, c. 3 cm. longe pedunculatae, ramis crassis divaricatis vel late adscendentibus dense lepidotis, floribus cymosis sessilibus, ramulis saepius elongatis et secundifloris; calyx campanulatus, 2 mm. longus, dense lepidotus, truncatus vel obsolete denticulatus; petala late obovata, alba, reflexa et calycem fere aequantia, glabra; antherae cuneiformes, 1-1.3 mm. longae, apice oblique truncatae et biporosae, exsertae; stylus gracilis, glaber, 3-4 mm. longus; bacca subglobosa, 4 mm. diam., sparse et minute lepidotus vel glabratus; semina pauca (1-5), c. 2 mm. longa, ochracea, laevia, lucida.—Guatemala: Cubilquitz, May, 1913, H. von Tuerckheim 4118 (Herb. Field Mus. No. 574,716, type); in 1901, alt. 350 m., Tuerckheim 7866. Sierra del Mico, between Los Amates and Izabal, Dept. Izabal, alt. 600 m., Kellerman 7380. British Honduras: Stann Creek railway, in jungle, March, 1929, Schipp 61. Big Creek, alt. 15 m., Schipp 40.

The species is easy to recognize because of the dense covering of brownish, closely appressed, stellate scales.

ERICACEAE

Arctostaphylos costaricensis (Small), comb. nov. *Comarostaphylis costaricensis* Small, N. Amer. Fl. 29: 89. 1914.

VERBENACEAE

Stachytarpheta jamaicensis (L.) Vahl, f. *albiflora*, f. nov.—Corolla alba; ceteris formae typicae omnino similis.—Honduras: In sandy thicket along the beach, Tela, Dept. Atlántida, December 28, 1927, Paul C. Standley 53814 (Herb. Field Mus. No. 583,934, type).

A large patch of this albino form was found in the vicinity of Tela.

SOLANACEAE

Solanum unguis-cati, sp. nov.—Frutex alte scandens, ramis gracibus teretibus glabris, vetustioribus ochraceis, aculeis 2-4 mm. longis recurvis compressis basi 2-3.5 mm. latis satis dense armatis; folia alterna 8-18 cm. longa, petiolata, pinnatisecta, segmentis 5-14, inferioribus distinctis, superioribus confluentibus, conformibus vel

saepe insigniter inaequalibus, majoribus lanceolatis vel lanceolato-oblongis, 2-8 cm. longis, 1-2 cm. latis, acuminatis vel longe attenuato-acuminatis, supra basin paullo angustatis, integris, membranaceis, marginatis, supra viridibus, ad nervos sparse et minute puberulis vel glabratris, subtus pallidioribus, glabris, secus costam saepe aculeis parvis recurvis armatis, segmentis minoribus inter majora saepe interpositis, 5-10 mm. longis, ellipticis, obtusis, rhachi plerumque marginata, aculeis brevibus recurvis hinc inde instructa; flores in cymis paucifloris graciliter pedunculatis dichotomis dispositi, subsecundi, longipedicellati, pedicellis fere filiformibus c. 14 mm. longis glabris inermibus; calyx 4 mm. longus sparse et minute puberulus vel glabratius, lobis late ovatis apiculatis; corolla caerulea stellato-rotata c. 2.5 cm. lata glabra; antherae 5-6 mm. longae, obtusae, anguste oblongae, 1.2 mm. latae, filamentis gracilibus 1.5 mm. longis.—Honduras: In wet thicket, Lancetilla Valley, near Tela, Dept. Atlántida, alt. 50 m., March 9, 1928, Paul C. Standley 56726 (Herb. Field Mus. No. 581,029, type). Lancetilla Valley, Standley 53328.

Vernacular name, "huevo de gato." Related to *S. Shannonii* Coulter, but in that the inflorescence is much larger and repeatedly branched, the corolla is larger, and the leaf segments are several times larger and broader. The vine is rather common about Lancetilla, but it was just coming into flower at the end of my work there, consequently it was impossible to obtain good specimens. It is a very showy plant when in full blossom because of its large and brilliantly colored corollas.

Lycianthes vulpina, sp. nov.—Frutex scandens interdum 3 m. longus, ramis gracilibus, teretibus, rimosis, brunneis, lucidis, pilis brunneis satis longis apice stellato-ramosis dense indutis; folia plerumque alterna, interdum opposita et inaequalia, foliis paris minoribus ovatis vel rotundatis et 1-2 cm. longis, foliis majoribus 8-12 mm. longe petiolatis, lamina ovata, elliptica vel ovato-oblonga, 5.5-12.5 cm. longa, 3-8 cm. lata, abrupte acuminata vel longiacuminata, acuminata angusto attenuata, basi rotundata vel obtusa, membranacea, integra, supra viridi, pilis stellatis stipitatis subferrugineis dense induta, subtus pilis similibus dense tomentosa; flores axillares, solitarii vel fasciculati, pauci, pedicellis 6-15 mm. longis dense stellato-hirsutis; calyx campanulatus 3 mm. longus, truncatus, ubique dense pilis simplicibus pallide ferrugineis dense hirsutis, appendicibus filiformibus 10 mm. longis onustus, in statu fructifero paullo accrescens; corolla alba 1.5 cm. longa, extus hispida, 5-loba, lobis latis obtusae, antherae inaequales 6-10 mm. longae, anguste oblongae, glabrae, obtusae, filamentis brevibus; bacca aurantiaco-rubra vel alba, globosa, glabra, c. 13 mm. diam., seminibus numerosis.—Honduras: Wet thicket, Lancetilla Valley, Dept. Atlántida, alt. 50 m., January 11, 1928, Paul C. Standley 54356 (Herb. Field Mus. No. 583,595, type). Lancetilla Valley, Standley 53285, 53670, 55221, 56550.

This Honduran plant evidently is closely related to *L. Purpusii* (Brandeg.) Bitter, of Mexico, resembling it closely in general appearance. In *L. Purpusii* the pubescence of the upper leaf surface consists of simple hairs, and that of the lower surface of much sparser and very short hairs.

Cyphomandra mollicella, sp. nov.—Frutex dendroideus 2-3-metralis, trunco gracili recto, corona densa lata depressa, heterophyllus; folia inferiora magna longe petiolata, usque ad 40 cm. longa et 30 cm. lata, pinnato-lobata, lobis plerumque 5, ovatis vel fere rotundatis, approximatis, sinibus angustis sejunctis, acutis vel breviter acuminatis, lobo terminali saepe caudato-acuminato; folia superiora minora, late ovata, oblongo-ovata vel rotundato-ovata, 2.5-4 cm. longe petiolata, integra, abrupte breviterque acuminata vel longiacuminata, basi saepe inaequalia, vulgo breviter vel profundius cordata, subcoriacea, supra viridia, glabra vel ad costam minute puberula, subtus paullo pallidiora, ubique minute velutino-puberula vel serius glabrata; racemi extra-axillares 2-5-4 cm. longe pedunculati, secundi, recurvi, pauciflori, pedicellis gracilibus 1.5-3 cm. longis dense et minute pilosulis rectis; calyx late campanulatus, minute puberulus, 3 mm. longus, 5 mm. latus subtruncatus vel obsolete lobatus; corolla viridis, 11-14 mm. longa, fere ad basin 5-fida, laciinis linear-lanceolatis, versus apicem sensim attenuatis, extus minute pilosulis, intus sparsius pilosulis; antherae 7-8 mm. longae, anguste oblongae, superne paullo attenuatae, minute puberulæ, filamentis brevibus—Honduras: In wooded swamp near Tela, Dept Atlántida, at sea level, January 18, 1928, Paul C. Standley 54720 (Herb. Field Mus No. 583,731, type). Lancetilla Valley, alt. 50 m., Standley 54441, 56549, 56833. Panama: Progreso, Chiriquí, July-August, 1927, Cooper & Slater 181 (Yale No. 10534).

In the Flora of the Panama Canal Zone (Contr. U. S. Nat. Herb. 27: 330. 1928) this plant is listed as “*Cyphomandra heterophylla* Donn Smith.” I can not determine, without consulting material in the National Herbarium, how this name originated, but I presume it is a herbarium name, which was assumed, but erroneously, to have been published. I can not find that this name has ever been published, although there is an earlier species described by another author under the same specific name. The latter has nothing to do with the Central American plant.

Cyphomandra mollicella is rather frequent from Panama to Guatemala. It is a striking plant, resembling a small tree when it has an opportunity to develop properly, with a smooth clean trunk and a neat spreading crown. Where I have seen it growing it appeared to be a large herb rather than a shrub, and I believe this is really the case, although Cooper and Slater report that in

Panama it attains a height of 7.5 meters, with a trunk 10 cm. in diameter. The Panama name is given as "monca prieta."

Melananthus guatemalensis (Benth.) Solereder, Ber. Deutsch. Bot. Gesell. 9: Generalversamml. 84. 1891. *Microschwenkia guatema-lensis* Benth. ex Hemsl. Biol. Centr. Amer. Bot. 2: 438 pl. 57, A. 1882.

The type of this curious little plant was collected on the Llano de Jutiapa, Guatemala, by Bernoulli, No. 716, and apparently nothing is known of it except what is contained in the original description. The following new collections and extension of range may now be reported for it: Honduras: In wet field, near Siguatepeque, Dept. Comayagua, alt. 1100 m., February, 1928, Standley 56286. In open pine forest near Siguatepeque, Standley 55855. The plant is rare in this locality, at least during the dry season. Probably it is plentiful enough at certain seasons, but it is very hard to find because the plants are small, 20 cm. high or less, with very slender, nearly leafless branches and minute flowers.

In the Solanaceae the plant is somewhat anomalous because of its peculiar fruit, and its family position has been debated, but Solereder refers it to the Solanaceae, where Bentham placed it originally. Solereder's long and interesting paper, in which two new specific combinations are made, seems to have been overlooked by the compilers of the Index Kewensis.

The general appearance of this herb is so much like that of *Schwenkia* that it must have a close relationship to that genus.

BIGNONIACEAE

Adenocalymna verrucosum, sp. nov.—Frutex alte scandens, ramulis gracilibus, subteretibus, striatis, ochraceis vel brunnescensibus, sparse elevato-lenticellatis, glabris, internodiis elongatis; folia opposita, petiolo gracili 1.5-2.5 cm. longo minute puberulo vel fere glabro, petiolulis aequilongis gracilibus subteretibus glabris vel sparsissime minuteque puberulis; foliola 2, elliptica vel oblongo-elliptica, 5-11.5 cm. longa, 2.5-6 cm. lata, subcoriacea, acuta vel abrupte acuta, interdum subacuta, basi obtusa vel rotundata, integra, supra laete viridia, sublucida, glabra, nervulis prominulis pallidis, subtus fere concoloria, secus costam praesertim in axillis barbata, aliter glabra, basi 3-nervia, costa gracili elevata, nervis lateralibus utroque latere 3-4, angulo acuto adscendentibus, elevatis, arcuatis, remote a margine conjunctis, nervulis prominulis arctissime reticulatis; flores ut videtur cimas paucifloras terminales efformantes, pedicellis fructiferis 8-15 mm. longis incrassatis; capsula juvenilis late linearis, 4-6

cm. longa, 7-9 mm. lata, paullo compressa, apice obtusa vel rotundata, ubique densissime longeque tuberculata, glabra.—Honduras: In wet forest, Lancetilla Valley near Tela, Dept. Atlántida, alt. 100 m., January 21, 1928, Paul C. Standley 54891 (Herb. Field Mus. No. 584,059, type). Also No. 53660 from the same locality.

In the forest near Lancetilla I found upon the ground weathered pods which probably belong to this same species. They are strongly compressed, about 2.5 cm. wide, and densely covered with tubercles, some of which are much elongate.

The generic position of this vine is uncertain because of lack of flowers, but I have placed it in *Adenocalymna* because I do not find tuberculate pods attributed to any other genus to which the plant might be referred.

ACANTHACEAE

Dyschoriste oaxacensis Kobuski.—This genus is not reported from Central America in Kobuski's Monograph of the American Species of *Dyschoriste* (Ann. Mo. Bot. Gard. 15: 9-90. 1928), but the following Honduras collections are referable to *D. oaxacensis*: Moist field near Siguatepeque, Dept. Comayagua, alt. 1,100 m., Standley 56310; in pine forest, Standley 56269; dry open bank, Standley 56089. The plant is frequent in the vicinity of Siguatepeque, and is rather conspicuous when in flower because of its purple corollas.

Aphelandra aurantiaca (Scheidw.) Lindl., var. *stenophylla*, var. nov.—A forma typica differt foliis breviter petiolatis linearibus vel lanceolato-linearibus, 7-26 cm. longis et 1-3 cm. latis, longissime attenuatis, basin versus longe attenuatis, margine saepe undulato.—Honduras: In wet forest, Lancetilla Valley near Tela, Dept. Atlántida, alt. 150 m., December 22, 1927, Paul C. Standley 53487 (Herb. Field Mus. No. 583,188, type). Also Nos. 52635 and 53875 from the same locality.

This form grows frequently with the typical one, which is common on the hills above Lancetilla. The leaves are so different from those of the type that at first glance one would assume that two species were represented, but apparently the two forms differ only in the shape of their leaves. I did not find any intermediate forms in the various localities where the two were growing together.

RUBIACEAE

Arcytophyllum ciliolatum, sp. nov.—Frutex erectus 15-35 cm. altus dense ramosus, ramis lateralibus brevibus, crassis, pallide

brunneis, bifarium puberulis, plerumque dense foliatis, internodiis interdum elongatis; stipulae late triangulares 1.5-2 mm. longae, acutae vel obtusae, puberulae, integrae vel obsolete denticulatae; folia sessilia vel subsessilia, oblonga vel lanceolato-oblonga, 5-8 mm. longa, 2.2-3.3 mm. lata, acuta, mutica, coriacea, glabra, 1-nervia, costa supra late sulcata subtus prominula, marginibus planis dense minuteque ciliolatis; flores terminales sessiles plerumque solitarii; hypanthium late obovoideum glabrum; calyx lobii 4 e basi triangulare subulato-attenuati, 2 mm. longi, scaberulo-ciliolati; corolla extus glabra, tubo crasso 4 mm. longo, lobis 4 lanceolato-oblongis 4 mm. longis acuminatis, intus brevissime denseque albido-villosis; antherae exsertae linearis-oblongae acutae, fere 2 mm. longae; capsula subglobosa 3 mm. longa costata.—Peru: Mountains near Tayabamba, Prov. Pataz, Dept. Libertad, alt. 3,900 m., July, 1914, A. Weberbauer 7023 (Herb. Field Mus. No. 548,977, type).

Related to *A. cephalanthum* (Wedd.) Standl., of Colombia, which has larger leaves, acuminate stipules, and capitate inflorescence.

***Arcytophyllum virgatum*, sp. nov.**—Frutex erectus 25 cm. altus et ultra multiramosus, ramis erectis gracilibus 1-2.5 mm. crassis rigidis angulatis ochraceis minute puberulis, internodiis plerumque 4-6 mm. longis; stipulae 2-2.5 mm. longae, pallidae, in vaginam longe connatae, parte libera ovata glabra vel minute puberula obtusa vel acuta cuspidata-acuminata et saepius paudentata; folia subsessilia, opposita et in axillis foliorum densissime fasciculata, anguste oblonga, obtusa, crassa, glabra, enervia, lucida, adscendentia vel erecta; inflorescentia terminalis, cymoso-capitata, densissime multiflora, 6-17 mm. lata, breviter pedunculata, floribus sessilibus dense congestis, bracteis 1-1.5 mm. longis, plerumque laciniatis; hypanthium turbinatum 1 mm. longum glabrum; calyx 4-partitus, laciniis anguste triangularibus 1.5 mm. longis erectis glabris acuminatis; corolla extus glabra, tubo 4 mm. longo superne dilatato fauce glabro, lobis 4 late ovatis subreflexis 1-1.5 mm. longis obtusis intus glabris; antherae subexsertae oblongae obtusae 0.8 mm. longae.—Peru: Province of Chachapoyas, Mathews 2123 (Herb. Kew., type).

A plant of distinctive appearance because of the very long and slender branches densely clothed with clusters of minute leaves. It is probably related to *A. parvifolium* Krause, of Peru, but that species is described as having still smaller leaves, entire stipules, and few-flowered cymes.

***Sickingia Maxonii* Standl.** Trop. Woods 14: 30. 1928. *Genipa Maxonii* Standl. Journ. Washington Acad. Sci. 8: 642. 1918.

This species, known heretofore only from Panama, may now be reported from Costa Rica: Monteverde, April, 1928, H. E. Stork 1677. The vernacular name is given as "inkwood."

Macrocnemum pilosinervium, sp. nov.—Ramuli validi, obtuse tetragoni vel subcompressi, dense adpresso-pilosoi, internodiis brevibus; stipulae magnae tenues glabratae caducae, perfectae non visae; petiolus crassus 1-1.7 cm. longus, dense adpresso-pilosus; lamina papyracea, obovata vel oblongo-obovata, 15-22 cm. longa, 7-10.5 cm. lata, acuta, apice obtuso, basi acuta vel longe angustata, supra fusca, glabra, nervis manifestis sed non elevatis, subtus pallidior, ad costam nervosque densissime pilosula, aliter sparse minuteque pilosula, costa valida elevata, nervis lateralibus utroque latere c. 12, angulo acuto adscendentibus, gracilibus, prominentibus, leviter arcuatis, prope marginem conjunctis, nervulis inconspicuis laxe reticulatis; inflorescentiae axillares cymoso-paniculatae, 11-15 cm. longe pedunculatae, basi foliis duobus 4-6 cm. longis fulcratae, 6-10 cm. longae et latae, dense multiflorae, ramosae, ramulis adpresso-pilosulis; bracteae vulgo parvae et lanceolato-subulatae; flores sessiles vel breviter pedicellati, conferti; hypanthium cylindricum 3-4 mm. longum, sparse puberulum vel fere glabrum; calyx 1 mm. longus 5-dentatus, dentibus late triangularibus acuminatis glabris; corolla extus glabra, tubo 1 cm. longo 3 mm. lato, lobis rotundatis 2-2.5 mm. longis, intus minute papillosum; fructus immaturus 8 mm. longus.—Peru: Without locality, in 1862, Mathews (Herb. N. Y. Bot. Gard., type).

The species of *Macrocnemum* are closely related and poorly defined, and the amount of material available is too small to enable one to estimate the value of the supposedly differential characters. The present plant, although not exhibiting any conspicuously outstanding characters, can not be referred satisfactorily to any of the species recorded from Peru.

Pentagonia peruviana, sp. nov.—“Frutex volubilis caudice brachiali,” ramulis crassis obtuse tetragonis sparse ad nodos strigillosis; stipulae triangulare-oblongae acuminatae 5 cm. longae, extus dense sericeo-strigillosae, intus glabrae; folia breviter petiolata opposita, petiolo gracili 3.5-5 cm. longo subtereti dense sericeo-strigilloso; lamina chartacea, obovato-elliptica, 32-45 cm. longa, 16-19 cm. lata, acuta, basi acuta vel subacuminata, supra glabra, nervis prominentibus, subtus pallida, ad nervos dense strigosa, aliter sparse et minute strigillosa, inter nervulos pulchre striolata, costa gracili elevatis, nervis lateralibus utroque latere c. 15, gracilibus, prominentibus, rectis, angulo acuto adscendentibus, prope marginem 1-2-dichotoma, ramis in marginem desinentibus, nervulis vix prominentibus; flores in axillis foliorum fasciculati, breviter pedicellati; calyx ante anthesin clausus acutus, in anthesi uno latere fissus, spathaceus, 2 cm. longus, 5-6 mm. latus, sparse adpresso-pilosus vel glabratius; corolla (perfecte evoluta non visa) 3 cm. longa et ultra, extus glabra vel in alabastro apice albido-strigosa, flavescens, tubo crasso superne paullo dilatato, lobis ovato-oblongis obtusis; stamina paullo supra basin tubi inserta, filamentis prope basin dense albido-barbatis, antheris oblongis 4 mm.

longis.—Peru: Banks of the Río Pastasa, April, 1857, *R. Spruce* 4968 (Herb. Kew., type).

All the other species of *Pentagonia*, several of which I have myself seen growing in Central America, are strictly erect shrubs or small trees, usually with stout, simple stems. It seems improbable, therefore, that Spruce is correct in describing the plant as a scandent shrub, especially since this habit of growth is very rare in the whole family Rubiaceae, although not unknown. *Pentagonia peruviana* is easily recognized by the spathaceous calyx.

Randia aurantiaca Standl., sp. nov.—Frutex inermis 1-4-metralis, ramulis gracilibus vel crassiusculis, teretibus, fusco-brunneis, novellis interdum hirtellis, internodiis brevibus vel elongatis; stipulae 5-7 mm. longae, hirtellae, erectae, e basi triangulari subulato-acuminatae; petioli 5-18 mm. longi, graciles, dense hirtelli; limbus oblongo-ellipticus vel obovato-ellipticus, 4-13 cm. longus, 2.5-6.5 cm. latus, apice obtusus vel plerumque abrupte breviterque acuminatus, basi acutus vel rarius obtusus, membranaceus, supra sparse vel dense breviterque pilosus vel puberulus, subtus dense griseo-tomentosus, costa et nervis gracilibus, prominentibus, nervis lateralibus utroque latere c. 9, angulo acuto adscendentibus, leviter arcuatis, prope marginem laxe conjunctis; flores hermaphroditi, ad apicem ramulorum 2-3 vel interdum solitarii, ad 7 mm. longe pedicellati; hypanthium anguste clavatum, 10-13 mm. longum, 2-2.5 mm. latum, dense breviterque velutino-pilosum; calycis limbus late campanulatus, c. 4 mm. longus et 6-8 mm. latus, dense pilosus, lobis 5, linearis-subulatis, 4-5 mm. longis, pilosulis; corolla aurantiaca, in alabastro longiacuminata, extus dense griseo-sericea, tubo 2 cm. longo, basi 5-6 mm. lato, apice contracto, lobis ovato-oblongis, longiacuminatis, 2.5 cm. longis, extus versus basin dense sericeis, intus glabris; antherae lineares, 5 mm. longae, semiexsertae; bacca immatura ellipsoidea, 1.5 cm. longa, costata, puberula, calyx persistente coronata.—Peru: Mountains east of Hacienda Chicama, Prov. Tumbes, Dept. Tumbes, in deciduous brushwood, alt. 600-700 m., February 19-24, 1927, A. Weberbauer 7665 (Herb. Field Mus. No. 571,808, type). Ecuador: In Peninsula Morro ad Playas, April, 1928, Luis Mille 190 (U. S.).

The plant is not closely related to any of the Randias described from Peru and Ecuador, and is noteworthy because of the orange or orange-red color of the corolla. It could be referred equally well, perhaps, to the genus *Sphinctanthus*, a group which does not seem to be separated by any constant characters from the genus *Randia*.

Randia Tessmannii, sp. nov.—Ramuli subteretes graciles glabri minutissime granulosi; stipulae oblongo-ovatae, 3.5 cm. longae, 1.5 cm. latae, apice acutae vel acuminatae, et longe filiformi-productae,

basi connatae, viridescentes, tenues, crebrinerviae, extus minute puberulae vel glabrate, persistentes, erectae, petiolis multo longiores; folia opposita, petiolo crassiusculo 7-10 mm. longo glabro; lamina oblonga vel lanceolato-oblonga, 14-18 cm. longa, 4-7 cm. lata, acuminata vel longe acuminata, acumine angusto acute attenuato, basi acuta vel obtusa, crasse membranacea vel subcoriacea, supra fusca, lucida, glabra, nervis et costa prominulis, subtus olivacco-viridis, in axillis venarum brevissime barbata, aliter glabra, costa gracili elevata, nervis lateralibus utroque latere c. 11, gracillimis, prominentibus, angulo acuto adscendentibus, subarcuatis, prope marginem conjunctis, nervulis prominulis reticulatis; flores masculi terminales, solitarii, 5 mm. longe pedicellati, bracteis magnis stipuliformibus persistentibus fulcratis, bracteis calye duplo longioribus; hypanthium nullum, calyce tubuloso, 1 cm. longo, 5 mm. lato, glabro, 5-dentato dentibus late triangularibus 2-2.5 mm. longis acutis, dentibus minoribus interpositis; corolla magna speciosa, tubo 4 cm. longo, 5-6 mm. lato, superne vix ampliato, extus dense et minute sericeo, intus in fauce dense albo-sericeo, inferne glabro, lobis 6-7, patentibus, oblongis vel obovatis, 5-5.5 cm. longis, 1.5-3 cm. latis, obtusis et abrupte acuminato-apiculatis, extus minutissime tomentulosis vel fere glabris, intus minute tomentulosis et sericeis; antherae lineares 2.3 mm. longae, 2 cm. supra basin tubi insertae, apice obtusae; stylus c. 1 cm. longe exsertus.—Peru: Stromgebiet des Ucayali von 10° S. bis zur Mündung, in 1923, G. Tessmann 3246 (Herb. Stockholm, type).

The species is an exceptionally well-marked one because of the very large corollas with their unusual number of lobes. The plant does not agree too well with any of the genera of the tribe Gardenieae, but it fits better in Randia (including Basanacantha) than elsewhere. It is quite as deserving of generic rank as most of the genera of this group, but the genera of this tribe of the Rubiaceae are so poorly marked that it certainly does not seem advisable to make any additions to their number, except upon unimpeachable characters.

Hoffmannia Mathewii, sp. nov.—Frutex ramosus, ramulis validis subteretibus dense ferrugineo-tomentosis, internodiis elongatis; folia ternata, petiolo gracili 4-6 mm. longo dense ferrugineo-tomentoso; lamina membranacea, elliptica vel elliptico-ovata, 3.5-5 cm. longa, 2-2.5 cm lata, longiacuminata, acumine angusto attenuato-acuto, basin versus sensim angustata, supra viridis, glabra, rhaphidibus minutis pallidis dense conspersa, subtus praecipue ad nervos dense ferrugineo-villosula, costa valida elevata, nervis lateralibus utroque latere c. 12, prominentibus, gracilibus, angulo lato adscendentibus, arcuatis, juxta marginem conjunctis, nervulis prominulis, transversis, subparallelis; cymae axillares, laxe pauciflorae, 8-15 mm. longe pedunculatae, pedunculo dense ferrugineo-tomentoso, pedicellis 3-6 mm. longis gracilibus; hypanthium turbinatum vel anguste turbinatum. 4-5 mm. longum, ferrugineo-tomentosum; calyx 4-partitus, laciniis

linearibus basi paullo dilatatis 4-6 mm. longis, versus apicem sensim attenuatis, villosulo-puberulis; corolla 10-11 mm. longa in alabastro acutiuscula, extus sparse ferrugineo-villosula, lobis 4 ovato-oblongis obtusis tubo duplo brevioribus; antherae semiexsertae oblongae obtusae.—Peru: Chachapoyas, Mathews (Herb. Kew., type).

Among the Peruvian species this is easy to recognize because of the very long and narrow calyx segments.

Hoffmannia hondurensis, sp. nov.—Frutex gracilis 1-2-metralis, sparse ramosus, ramis teretibus, viridibus, glabris, dense et minute pallido-lenticellatis, internodiis brevibus vel elongatis; stipulæ caducae, non visae; folia opposita, petiolo crassiusculo 0.5-2 cm. longo, lamina papyracea oblanceolato-oblonga vel oblongo-obovata, 13-26 cm. longa, 4-8.5 cm. lata, abrupte acuminata vel longiacuminata, acumine angusto attenuato, basin versus longe vel longissime attenuata, glabra, fere concolor, nervis supra non elevatis, costa subtus prominente crassiuscula, nervis lateralibus utroque latere c. 14, angulo lato adscendentibus, gracilibus, prominulis, arcuatæ, prope marginem conjunctis, nervulis inconspicuis laxe reticulatis, pagina superiore saepe raphidibus numerosis minutis brevibus notata; inflorescentiae paucæ, ad axillas solitariae vel fasciculatae, plerumque 2-4-floræ, glabrae, pedicellis gracilibus 5-8 mm. longis; calyx 0.7 mm. longus brevissime dentatus, dentibus triangularibus acutis; fructus albus, carnosus, subglobosus, 4-5 mm. longus, glaber, seminibus numerosissimis minutis brunneis grosse foveolatis.—Honduras: In wet forest on the hills above Lancetilla Valley, Dept. Atlántida, alt. 200-500 meters, December 12, 1927, Paul C. Standley 52905 (Herb. Field Mus. No. 582,885, type). Lancetilla Valley, Standley 52768, 53351, 53871, 52645.

Although this shrub is common in the Lancetilla Valley, it was not in flower during the winter, and I was able to obtain only fruiting specimens. Like most other Hoffmannias, it has no conspicuous characters, but it does not agree in all respects with any of the numerous species now known from Central America.

Anisomeris peruviana, sp. nov.—Ramuli graciles teretes cinerei, novellis sparse et minute adpresso-pilosulis vel fere glabris; stipulæ 1.5-2 mm. longæ, deltoideæ, subulato-acuminatae, persistentes, erectæ; folia opposita, petiolo 3-6 mm. longo valido supra sulcato glabro; lamina elliptica vel oblongo-elliptica, 2-7 cm longa, 1.5-3.5 cm. lata, obtusa vel subacuta, basi acuta, subcoriacea, supra fusca, glabra, nervis non elevatis, subtus brunneo-fusca, ad axillas nervorum foveolata et barbata, aliter glabra, costa gracili elevata, nervis lateralibus utroque latere c. 7, prominentibus, angulo acuto adscendentibus, subarcuatæ, remote a margine conjunctis, nervulis obsoletis; inflorescentiae axillares, solitariae vel fasciculatae, 1-2 cm. longe pedunculatae, umbelliformes, dense paucifloræ, pedunculo gracili

glabro, floribus sessilibus vel breviter pedicellatis; hypanthium turbinatum, 1.5 mm. longum, glabrum vel hinc inde strigilsum; calyx 1 mm. longus, glaber vel glabratus, lobis brevissimis rotundatis; corolla 18 mm. longa, tubo gracillimo, inferne glabro, superne parum ampliato et sparse strigilloso, lobis 4, ovali-oblongis, 2-2.5 mm. longis, obtusis, intus glabris, extus dense strigillosi.—Peru: Stromgebiet des Ucayali von 10° S. bis zur Mündung, in 1923, G. Tessmann 3481 (Herb. Stockholm, type).

A relative of *A. albicaulis* (Rusby) Standl. (*Guettarda albicaulis* Rusby), a Bolivian species. The latter differs in its narrow calyx lobes, densely pubescent corolla, and the spreading pubescence of the peduncles.

Anisomeris angustifolia (Benth.), comb. nov. *Chomelia angustifolia* Benth. in Hook. Journ. Bot. 3: 235. 1841.

Coussarea auriculata, sp. nov.—Ramuli crassi, subteretes, ochracei, glabri, internodiis elongatis; stipulae latissime triangulares, 2-3.5 mm. longae, obtusae vel fere truncatae, persistentes; folia subsessilia, petiolo vix 1-2 mm. longo; lamina late elliptica vel elliptico-obovata, 11-19 cm. longa, 4.5-13 cm. lata, asymmetrica, abrupte sensimve acuminata, interdum caudato-acuminata, acumine angusto obtuso, basin versus sensim angustata vel interdum abrupte contracta et longe decurrentis, basi angusta cordata, auriculis rotundatis, glabra, subcoriacea, supra laete viridis, nervis paullo prominentibus, subtus pallidior, costa valida elevata, nervis lateralibus utroque latere c. 10, prominentibus, angulo lato vel acuto adscendentibus, arcuatis, prope marginem conjunctis, nervulis prominulis laxe reticulatis; inflorescentia terminalis thyrsideo-paniculata, 1-2.5 cm. longe pedunculata, c. 7 cm. longa et 6-7 cm. lata, dense multiflora, glabra, floribus cymosis, cymis multifloris pedunculatis, ramis inferioribus paniculae oppositis vel verticillatis crassiusculis, pedicellis plerumque 1-2 mm. longis; bracteae obsoletae; hypanthium obovoideum laeve 1.2 mm. longum; calyx campanulatus 0.8 mm. longus truncatus; corolla hypocrateriformis, tubo gracili, 7 mm. longo, 1 mm. crasso, superne vix ampliato, lobis 4, patentibus, oblongo-linearibus, 4 mm. longis, obtusis; antherae semiexsertae.—Peru: Stromgebiet des Marañón, Santiago-Mündung am Pongo de Manseriche, ca. 77° 30' West, in 1924, G. Tessmann 4647 (Herb. Stockholm, type).

The species is a well-marked one, easy of recognition because of the sessile leaves with definite auricles at the base.

Coussarea longiacuminata, sp. nov.—Frutex vel arbor parva omnino glabra, ramulis gracilibus subteretibus fuscis, internodiis 2-3.5 cm. longis; stipulae in vaginam truncatam 2-2.5 mm. longam connatae, persistentes; folia opposita, petiolo gracili 6-9 mm. longo; lamina anguste elliptico-oblonga, 7-9.5 cm. longa, 2-3 cm. lata, longe

caudato-acuminata, acumine oblongo-lineari obtuso 1-1.5 cm. longo, basi acuta, decurrentes, subcoriacea, marginata, supra viridis, costa nervisque vix prominulis, lucida, subtus pallidior, costa gracili elevata, nervis lateralibus utroque latere c. 12, angulo lato divergentibus, fere rectis, marginem attingentibus, nervis prominulis laxe reticulatis; inflorescentiae terminales et ex axillis supremis, sessiles vel pedunculatae, e basi trichotomae, laxe pauciflorae, foliis breviores, cymoso-corymbosae, cymulis plerumque trifloris, pedicellis c. 3 mm. longis rectis; hypanthium 1 mm. longum; calyx 1-1.3 mm. longus 4-denticulatus, dentibus remotis angustis acutis; corolla hypocrita-terimorpha, tubo gracili 9-10 mm. longo 1.4 mm. lato, lobis 4 anguste oblongis obtusis 4-5 mm. longis; antherae inclusae.—Peru: Above Tabaconas, Prov. Jaen, Dept. Cajamarca, alt. 2,400-2,500 m., April, 1912, A. Weberbauer 6117 (Herb. Field Mus. No. 548,690, type).

Coussarea tenuiflora Standl., sp. nov.—Fere glabra; ramuli crassi, tetragoni, 6 mm. crassi; stipulae deciduae, non visae; folia opposita, petiolis crassiusculis, 2-3 cm. longis, subteretibus; limbus ovato-ellipticus, 11.5-28 cm. longus, 6-14.5 cm. latus, abrupte caudato-acuminatus, acumine e basi triangulari longe attenuato, obtuso, 2 cm. longo, basi late obtusus vel acutus, crasse membranaceus, concolor, marginatus, supra ad costam puberulus, aliter glaber, costa et nervis lateralibus utrinque prominentibus, gracilibus, nervis lateralibus utroque latere c. 12, angulo lato adscendentibus, subarcuatis, prope marginem irregulariter arcuato-conjunctis, nervulis prominentibus, reticulatis; inflorescentiae terminales, cymoso-corymbosae, subsessiles, trichotomae, 4.5 cm. longae et latae, dense multiflorae, floribus sessilibus; hypanthium obovoideum, fere 2 mm. longum, in siccitate obtuse costatum; calyx 1.6 mm. longus, hypanthio latior, truncatus; corollae tubus 2.5-28 mm. longus, gracilis, superne vix dilatatus, fauce fere 2 mm. latus, lobis oblongis, obtusis, 8 mm. longis.—Peru: Near Tarapoto, 1855-56, R. Spruce 4422 (Gray Herb., type; duplicate in herb. Kew.).

In general appearance this plant suggests *C. hydrangeaefolia* (Benth.) Benth. & Hook., but in that the corolla is much smaller.

Faramea stenura, sp. nov.—Frutex vel arbor parva 2.5-6 m. alta omnino glabra, ramulis gracilibus viridibus subteretibus, internodiis elongatis; stipulae 6-13 mm. longae, deciduae, in vaginam connatae, lobis longe subulato-attenuatis; folia opposita, petiolo gracili 7-12 mm. longo supra sulcato; lamina membranacea, anguste oblonga, interdum superne paullo latior et versus basin subangustata, 11-13 cm. longa, 3-5 cm. lata, basi acuta, apice abrupte contracta et in caudam e basi triangulari linearem longiattenuatam 1.5-2.5 cm. longam desinens, supra viridis, costa prominente, nervis prominulis, subtus paullo pallidior, costa gracili elevata, nervis lateralibus utroque latere c. 12, gracillimus, prominentibus, angulo fere recto divergentibus, fere rectis, remote a margine conjunctis, nervis

transversis parallelis interpositis et nervulis prominulis laxe reticulatis conjunctis; inflorescentiae terminales sessiles cymoso-corymbosae, c. 8 cm. longae et 11 cm. latae, dense multiflorae, bracteis inconspicuis, triangularibus vel lanceolato-subulatis, 1-2 mm. longis, pedicellis 2-6 mm. longis, validis, superne paullo incrassatis; hypanthium obovoideum, 1-1.5 mm. longum; calyx cupularis c. 1 mm. longus, 4-dentatus, dentibus inaequibus, triangularibus vel lanceolatis, attenuato-acuminatis; corolla caerulea, tubo gracili, 7-8 mm. longo, 1.5 mm. lato, lobis 4 elliptico-oblongis, 5 mm. longis, patentibus, obtusis; fructus viridis, 13-15 mm. latus, 6-7 mm. altus, 7 mm. crassus, fere laevis; semen 1 cm. longum, facie inferiore profunde sulcatum.—Honduras: In wet forest near the summit of the mountains above Lancetilla Valley, Dept. Atlántida, alt. 600 meters, March 13, 1928, Paul C. Standley 56743 (Herb. Field Mus No. 581,582, type). Lancetilla Valley, Standley 52896, 53126, 53190, 56886.

Among the Central American Farameas this is well marked by the handsome blue flowers and the narrow leaves with very long, tail-like acuminations.

Faramea talamancae, sp. nov.—Omnino glabra; ramuli graciles, virides, subteretes; stipulae 8-9 mm. longae, persistentes, in vaginam angustam viridem connatae, lobis apice obtusis et seta 3 mm. longa terminatis; folia opposita, petiolo gracili 5-7 mm. longo supra late sulcato; lamina membranacea, oblonga vel anguste oblonga, 11-16 cm. longa, 3.5-5 cm. lata, basi acuta, apice obtusa vel subrotundata et abrupte in cuspidem c. 1 cm. longam obtusam angustum contracta, supra viridis, costa prominente, nervis prominulis, subtus paullo pallidior, costa gracili elevata, nervis lateralibus utroque latere c. 11, prominentibus, gracillimis, angulo fere recto divergentibus, fere rectis, remote a margine conjunctis, nervis transversis parallelis interpositis et nervulis obscuris laxe reticulatis connexis; inflorescentiae terminales 3.5-6 cm. longe pedunculatae, cymoso-corymbosae, laxe multiflorae, 6-7 cm. longae et 10 cm. latae, bracteis minutis et inconspicuis, pedicellis gracilibus plerumque 8-10 mm. longis; hypanthium obovoideum 1 mm. longum; calyx 0.4-0.6 mm. longus, truncatus, subintegerrimus vel remote 4-denticulatus, dentibus triangularibus vel subulatis; corolla ut videtur caerulea, tubo gracili, 10-12 mm. longo, 1 mm. lato, lobis 4 elliptico-oblongis, 5-7 mm. longis, obtusis vel acutiusculis.—Panama. Talamanca Valley, February 3, 1921, M. A. Carleton 135 (Herb. Field Mus. No. 578,962, type). Changuinola Valley, 1923, V. C. Dunlap 135.

Closely related to *F. stenura* Standl., but differing in the short acuminations of the leaves, the persistent stipules, the long pedicels, and the minute calyx.

Faramea phyllonomoides, sp. nov.—Frutex vel arbor parva omnino glabra, ramulis gracilibus subteretibus fuscis, internodiis

brevibus; stipulae deciduae, late ovatae, connatae, in aristam apicalem 2 mm. longam desinentes; folia opposita, petiolo 2-4 mm. longo supra late sulcato; lamina anguste elliptico-oblonga vel lanceolato-oblonga, 6-10.5 cm. longa, 1.7-3.8 cm. lata, abrupte caudato-acuminata, acumine linearis 1-1.5 cm. longo obtuso, basi acuta vel obtusa, crasse papyracea, lucida, supra viridis, costa nervisque prominulis, subtus fere concolor, costa gracili elevata, nervis lateralibus utroque latere c 12, angulo recto divergentibus, gracillimis, prominulis. fere rectis, remote a margine conjunctis, nervulis prominulis laxe reticulatis, margine revoluto; inflorescentia terminalis sessilis vel ex axillis supremis, basi trichotoma, cymoso-paniculata, laxe pauciflora, floribus saepe subumbellatis, pedicellis rectis 2-6 mm longis; bracteae minutae triangulares; hypanthium 1.5 mm. longum; calyx 1 mm. longus 4-lobus, lobis remotis triangularibus subulato-acuminatis; corolla in alabastro acutiuscula.—Peru: Chanchamayo Valley, Dept Junín, alt. 1,500 m., September, 1924-27, Carlos Schunke 277 (Herb. Field Mus. No. 571,333, type), 439.

Apparently related to *F. maynensis* Spruce, but differing in the narrow subulate-acuminate calyx lobes. Neither of the collections, unfortunately, has either developed corollas or fruits.

Rudgea Sprucei, sp. nov.—Arbor 6-metralis ramosa, ramulis crassis subcompressis glabris; stipulae 5-6 mm. longae, late ovatae, obtusae, glabrae, in margine dense aculeoligerae, aculeolis albidis; folia breviter petiolata opposita, petiolo crasso 12-17 mm. longo supra late sulcato glabro; lamina crasse membranacea, oblongo-ovata, obovata vel rarius late oblonga, c. 18 cm. longa et 8-9 cm. lata, apice obtusa vel rotundata et breviter atque abrupte acuminate, acumine obtuso, basin versus angustata, interdum abrupte contracta et decurrens, utrinque glabra, supra viridis, costa impressa, nervis non elevatis, subtus fere concolor, costa gracili elevata, nervis lateralibus utroque latere c. 8, prominentibus, gracilibus, angulo lato adscendentibus, inaequalibus, prope marginem conjunctis, nervulis prominulis laxe reticulatis; inflorescentia terminalis 6-9 mm. longe pedunculata, cymoso-capitata, dense pauciflora, floribus sessilibus, bracteis inconspicuis; hypanthium latissime turbinatum c. 1.5 mm. longum glabrum; calyx 1.5 mm. longus 5-lobus, lobis anguste triangularibus acutis ciliatis remotis; corolla alba, extus glabra, 17 mm. longa, coriacea, tubo crasso obconico basi 3 mm. lato superne sensim dilatato et ore 5 mm. lato, lobis 5 oblongis obtusis tubo subaequalibus; stamina 5 mm. supra basin tubi inserta, filamentis gracilibus prope basin dense albido-villosulis, antheris oblongis exsertis 2.5 mm. longis; drupa ovato-globosa, coccinea, carnosula, usque ad 3.5 cm. diam., basi et apice depressa, glabra.—Peru: In sylvis excelsis montis Guayrapurina, August, 1855, R. Spruce 3995 (Herb. Kew., type).

Spruce 4056 from Tarapoto probably is referable to the same species.

Cephaelis dolichophylla, sp. nov.—Ramuli crassi glabri; stipulae persistentes, erectae, crassae, ovato-triangulares, acuminatae, 18 mm. longae, 11 mm. latae, glabrae; folia breviter petiolata, opposita, petiolo crasso 2-2.5 cm. longo glabro; lamina chartacea, oblanceolato-oblonga vel anguste oblongo-lanceolata, 22-29 cm. longa, 4.5-10 cm. lata, acuta vel sensim longiacuminata, basin versus longe attenuata, utrinque glabra, supra griseo-viridis, nervis non elevatis, sublucida, subtus pallida, minute albido-puncticulata, brunnescens, costa gracili elevata, nervis lateralibus utroque latere c. 12, angulo acuto adscendentibus, prominentibus, subarcuatis, marginem attingentibus, nervulis obsoletis; inflorescentia terminalis capitata 12 cm. longe pedunculata, pedunculo recto valido glabro, capitulo multifloro denso, floribus sessilibus dense congestis; bracteae exteriore late ovatae, 3-4 cm. longae, 2.5 cm latae, breviter connatae, acutae, rigidae, glabrae, bracteis interioribus angustioribus, intimis spatulatis longe petiolatis c. 5 mm latis acutis; fructus subglobosus vel ovalis, 5-7 mm. longus, glaber, obscure costulatus; calyx ad apicem fructus persistens, annuliformis, truncatus.—Peru: Prope Yurimaguas ad flumen Huallaga, May, 1855, R. Spruce 3876 (Herb. Kew., type).

Well marked by the long and very narrow leaves with long-tapering bases.

Cephaelis oleandrella, sp. nov.—Frutex 2.5 m. altus, ramulis gracillimis teretibus laevibus viridibus glabris, internodiis brevibus vel elongatis; stipulae in vaginam 1-3 mm longam adpressam truncatam glabram connatae, vagina in lobos 2 subulatos vel setiformes 1-2 mm. longos desinente; folia opposita, petiolo gracili glabro 2-4 mm. longo; lamina papyracea lineari-oblonga vel anguste lanceolato-oblonga, 4-8.5 cm. longa, 1-1.3 cm lata, saepe subfalcata, longissime et anguste acuminata, basi attenuata, supra glabra, costa prominente, nervis obscuris, subtus pallida, lucida, costa gracili utroque latere membrana hyalina 0.3 mm. lata pallida saepius ciliata marginata, nervis lateralibus numerosissimis, obscuris, angulo recto divaricatis, parallelis, marginem attingentibus; pedunculi terminales 2.5-3.5 cm. longi, graciles, glabri, apice incrassati; capitula solitaria 7-9 mm. lata; bracteae exteriore late ovatae 6-7 mm. longae, acuminatae, ochroleucae, rigidae, adpressae, ciliolatae, interiores breviores et angustiores; flores pauci, conferti, sessiles; calyx 2-3 mm. longus 5-lobus, lobis angustis acuminatis ciliatis; corolla ochroleuca tubulosa, extus glabra, 9 mm. longa, tubo apice 2.5 mm. lato, lobis triangularibus acutis 2 mm. longis.—Peru: On montaña slope, La Merced, alt 1,200 m, August 27 to September 1, 1923, J. Francis Macbride 5635 (Herb. Field Mus. No. 536,673, type; duplicate in U. S. Nat. Herb.). Chanchamayo Valley, Dept Junín, Schunke 410.

The species is noteworthy for its very narrow leaves, which have a curious, ribbon-like and usually short-ciliate membrane bordering the costa beneath for its whole length.

Cephaelis surinamensis, sp. nov.—Ramuli graciles, teretes, ochracei, dense pilis molibus c. 2 mm. longis pilosi, internodiis 3-5 cm. longis; stipulae in vaginam villosam 2 mm. longam connatae, vagina in lacinias 2 lineares pilosas 2.5-3 mm. longas desinente; folia opposita, petiole gracili 4-5 mm. longo dense et longe piloso; lamina ovata, 2.5-4 cm. longa, 1.4-2 cm. lata, versus apicem acutam angustata, basi late rotundata vel subcordata, membranacea, supra viridis, pilis longis debilibus patentibus sat dense pilosa, nervis prominulis, subtus ut videtur purpurascens, ad nervos longe pilosa, costa gracili elevata, nervis lateralibus utroque latere c. 10, prominentibus, angulo acuto adscendentibus, fere rectis, remote a margine conjunctis, nervulis prominentibus laxe reticulatis; capitula terminalia vel pseudo-axillaria, solitaria, 1.5 cm. longe pedunculata, dense multiflora, pedunculo gracili dense longipiloso; bracteae lanceolatae vel anguste ovatae, virides, 5-8 mm. longae, utrinque longipilosae, attenuato-acuminatae; calyx fere ad basin 5-partitus, laciniis setaceis pilosis; corolla 8 mm. longa infundibuliformis, extus sparse breviterque pilosa, tubo superne ampliato, limbo c. 7 mm. lato intus glabro, lobis lanceolato-oblongis acutis.—Surinam: Without definite locality, A. Kappler, ed. R. F. Hohenacker, 1845 (Herb. Stockholm, type). Ad fl. Marowyne medium in silvis, *Kappler 1982* (Stockholm).

The plant closely resembles in general appearance *C. horridula* (Muell. Arg.) Standl. (*Psychotria horridula* Muell. Arg. in Mart. Fl. Bras. 6⁵: 344. pl. 53, f. 2. 1881) of Brazil, but in the latter the outer bracts are much larger and the leaves are narrower and either obtuse or acute at base.

Cephaelis spathicalyx (Muell. Arg.), comb. nov. *Psychotria spathicalyx* Muell. Arg. in Mart. Fl. Bras. 6⁵: 319. 1881.

Cephaelis multiplex (Muell. Arg.), comb. nov. *Psychotria multiplex* Muell. Arg. in Mart. Fl. Bras. 6⁵: 319. 1881.

Cephaelis guianensis (Aubl.), comb. nov. *Carapichea guianensis* Aubl. Pl. Guian 1: 168. pl. 64 1775. *Uragoga guianensis* Pulle, Enum. Pl. Surin. 446 1906.

Cephaelis Kappleri (Miq.), comb. nov. *Carapichea Kappleri* Miq. Stirp. Surin. 181. 1850. *Uragoga Kappleri* Pulle, Enum. Pl. Surin. 446. 1906.

Cephaelis domingensis (Urban), comb. nov. *Uragoga domingensis* Urban, Repert. Sp. Nov. 17: 7. 1921.

Cephaelis domingensis var. *Fuertesii* (Urban), comb. nov. *Uragoga domingensis* var. *Fuertesii* Urban, Repert. Sp. Nov. 17: 8. 1921.

Cephaelis silvicola (Krause), comb. nov. *Uragoga silvicola* Krause, Verh. Bot. Ver. Brandenb. 50: 115. 1908.

Cephaelis phyllocalymma (Muell. Arg.), comb. nov. *Psychotria phyllocalymma* Muell. Arg. in Mart Fl. Bras. 6⁶: 373. 1881.

Palicourea longistipula, sp. nov.—Ramuli crassi subteretes glabri, novellis interdum bifarium pilosulis, internodiis elongatis; stipulae magnae, persistentes, 2-3.5 cm. longae, bifidae, glabrae, laciiniis semiovatis acuminatis fuscis; folia opposita, petiolo crasso 6-12 mm longo glabro; lamina coriacea, elliptica vel oblongo-elliptica, 11-18 cm. longa, 4-9 cm. lata, longe et angustissime acuminata, acumine sensim attenuato, basi acuta, supra luteo-viridis, sparse scaberula, asperula, nervis prominentibus, subtus fere concolor, praesertim ad costam validam elevatam et ad nervos hispidula, nervis lateralibus utroque latere c 13, gracilibus, prominentibus, angulo acuto adscendentibus, valde arcuatis, in marginem desinentibus, nervulis prominentibus arcte reticulatis; inflorescentia thyrsideo-paniculata, pedunculata, parte visa (a ramo disjuncta) 5 cm. longa et 3 cm. lata, dense multiflora, ramis suboppositis brevibus adscendentibus hispidulis, floribus sessilibus dense congestis, bracteis anguste linearibus 5-8 mm. longis sparse puberulis vel fere glabris; hypanthium obovoideum 0.8 mm. longum sparse puberulum vel glabratum; calyx glabratus 0.5 mm. longus, laciiniis lanceolato-oblongis acutis; corolla 5-6 mm. longa, extus sparse puberula vel glabrata, fause barbata, tubo basi paullo ampliato gracili, lobis oblongis 2 mm. longis obtusis.—Peru: Tatanara, August, 1854, Lechler 2622 (Herb. Kew., type).

Related to *P. Macbridei* Standl., but differing in the smaller stipules, fewer lateral nerves of the leaves, and much narrower bracts of the inflorescence.

Palicourea levis, sp. nov.—Arbor 6-metralis vel frutex 2-3-metralis, ramis gracilibus olivaceis, novellis glabris vel minutissime puberulis, internodiis 1-4.5 cm. longis; stipulae persistentes, glabrae, in vaginam truncatam 1.5-2.5 mm. longam connatae, vagina in lobos 2 anguste triangulares vel late lineares 1.5-2 mm. longos desinente; folia opposita, petiolo crassiusculo 7-15 mm. longo glabro supra sulcato; lamina oblonga vel elliptico-oblonga, 5.5-11 cm. longa, 2-4 cm. lata, acuta vel breviter acuminata, acumine angusto acuto, basi obtusa vel saepe abrupte breviterque contracta, crasse membranacea, utrinque glabra vel subtus in axillis costarum secundiarum minute et sparse barbata, supra viridis, costa paullo elevata, nervis non elevatis, subtus pallidior, costa gracili elevata, nervis lateralibus utroque latere 10-14, prominentibus, angulo lato vel angusto adscendentibus, arcuatis, juxta marginem conjunctis, nervulis prominentibus laxe reticulatis; inflorescentiae terminales, parvae, dense multiflorae, 2-3.5 cm. longe pedunculatae vel rarius sessiles, thyrsideo-paniculatae, 3-7 cm. longae et fere aequilatae, ramis brevibus patentibus

vel adscendentibus minute puberulis vel hirtellis oppositis, floribus sessilibus congestis, bracteis linearibus vel subulatis 1-4 mm. longis; hypanthium minutissime puberulum; calyx c. 0.6 mm. longus, minute puberulus, dentibus 5 late ovatis obtusis vel acutiusculis; corolla parva, alba vel lutescens, extus minute scaberulo-puberula, in alabastro apice obtuso pentagona, 5-6 mm. longa, tubo superne paullo dilatato, basi subampliato, lobis late ovatis obtusis tubo triplo brevioribus; antherae interdum exsertae; fructus didymoglobosus, 6 mm. latus, fere 5 mm. altus, glaber, laevis, calyce persistente coronatus.—Peru: Summit of Mt. Guayrapurina, region of Tarapoto, July, 1855, R. Spruce 4062 (Herb. Kew., type). Huaycani, alt. 3,000-3,300 m., May, 1866, Pearce (K). Ecuador: In Andibus Ecuadorensibus, 1857-59, Spruce (K). Pichincha, Jameson (K). Tungurahua, Spruce (K).

It is not certain that all the specimens cited are conspecific, but certainly they are closely related. They represent a species near *P. Seemannii* Standl., but in the latter the corolla is glabrous and the leaves are pilose beneath along the nerves.

Palicourea Kanehirae, sp. nov.—Arbor parva, ramulis crassis obtuse tetragonis, dense pilis longis gracilibus ochraceis pilosis, internodiis elongatis; stipulae maximae, oblongae, 2.5-3.8 cm. longae, tenues, ferrugineae, extus dense pilosae, apice breviter bilobae, lobis oblongo-ovatis acutis; folia opposita, petiolo crasso 0.8-1.5 cm. longo; lamina late elliptica vel rotundato-ovata, 14-21 cm. longa, 9-12 cm. lata, apice rotundata et breviter cuspidato-acuminata, acumine 1-1.5 cm. longo attenuato, basi paullo angustata et obtusa, subcoriacea, supra fusco-viridis, praesertim ad nervos hispidula vel glabrata, nervis manifestis, nervulis impressis, subtus brunnescens, ubique dense breviterque hirsuta, ad costam pilis longis pallidis dense hirsuta, costa valida elevata, nervis lateribus utroque latere c. 19, gracilibus, prominentibus, angulo fere recto adscendentibus, valde arcuatis, marginem attingentibus; inflorescentia 5-6 cm. longe pedunculata, pyramidalis-paniculata, dense multiflora, 9-11 cm. longa, 7-9 cm. lata, rhachi crassa angulata, ramulis divaricatis vel adscendentibus rigidis dense pilosis; bracteae linearis-subulatae 3-12 mm. longae pilosulae; flores cymosi pedicellati, pedicellis erectis validis 3-6 mm. longis; hypanthium late turbinatum, 1.2 mm. longum, dense hispidulum; calyx 2.5-3.5 mm. longus profunde 5-lobus, lobis oblongis vel ovatis, inaequalibus, obtusis vel subacutis, sparse pilosulis, ciliolatis; corolla tubulosa 9 mm. longa, extus sparse pilosula, tubo crasso, basi vix ampliato, superne paullo dilatato, fauce 2.5 mm. lato, lobis ovato-oblongis obtusis apice breviter cucullatis.—Peru: Pampayacu, January 30, 1927, Ryozo Kanehira 18 (Gray Herb., type).

The species is a striking one, notable for the large stipules and broad, copiously pubescent leaves. It is not closely related to any other with which I am familiar.

Palicourea Macbridei, sp. nov.—Frutex vel arbor parva, ramulis crassis glabris; stipulae magnae, 2-3.5 cm. longae, ovatae, acuminate, basi cordatae et amplectentes, tenues, venosae, ferrugineae, persistentes, internodos fere occultantes; folia opposita, petiolo crasso 1.5-3 cm. longo glabro; lamina subcoriacea, elliptica vel elliptico-oblonga, 16-32 cm. longa, 5.5-14 cm. lata, abrupte breviterque acuminata, acumine triangulari attenuato, basi cuneato-acuta, supra viridis, glabra vel ad costam sparse puberula, nervis prominulis, subtus ferruginea, ad nervos breviter hirsuta, costa valida elevata, nervis lateralibus utroque latere c. 20, elevatis, gracilibus, angulo lato adscendentibus, arcuatis, marginem attingentibus; inflorescentiae 2-4 cm. longe pedunculatae, thyrsideo-paniculatae, dense multiflorae, c. 8 cm. longae et 7 cm. latae, rhachi crassissima angulata, ramulis validis divaricatis sparse pilosulis vel fere glabris; bracteae ovatae vel oblongae, 2-6 mm. longae, obtusae vel acutae, glabrae; flores cymosi sessiles vel 1-3 mm. longe pedicellati; hypanthium late turbinatum 1.5 mm. longum glabrum; calyx 2 mm. longus profunde 5-lobus, lobis ovato-oblongis, obtusis vel acutis, glabris; fructus globosus 5 mm. longus, glaber, sulcatus, calyce persistente coronatus, costis obtusis.—Peru: In rain forest, Cushi, alt. 1,500 m., June 19-23, 1923, J. Francis Macbride 4821 (Herb. Field Mus. No. 535,858, type; duplicate in U. S. Nat. Herb.).

The collector's notes state that the flowers are metallic purple. This probably relates to the whole inflorescence, since no corollas are present on the specimens. Among the Peruvian species of the genus, *Palicourea Macbridei* is easily recognized by the form and exaggerated size of the stipules.

Palicourea Lechleri, sp. nov.—Frutex ramulis crassis subteretibus, vetustioribus ochraceis, novellis densissime pilis brevibus patentibus luteis hispidulis, internodiis plerumque 1-2 cm. longis; stipulae in vaginam hispidulam 1-2 mm. longam connatae, vagina in lobos 4 lineares ciliatos desinente; folia opposita, petiolo crassiusculo 1.5-2 mm. longo luteo-hispido; lamina coriacea elliptico-oblonga vel ovato-oblonga, 3-5 cm. longa, 1.5-2 cm. lata, longiacuminata, acumine angusto attenuato, basi acuta vel obtusa, supra minute et densissime scaberula, secus costam prominentem hispidula, nervis obscuris, subtus luteo-viridis, dense pilis brevibus patentibus luteis hispidula, costa valida elevata, nervis lateralibus utroque latere c. 8, elevatis, validis, angulo acuto adscendentibus, arcuatis, marginem saepe revolutum fere attingentibus; inflorescentia terminalis sessilis vel 1-1.4 cm. longe pedunculata, cymoso-corymbosa, dense pauciflora, 1.5-2 cm. longa et lata, basi plerumque trichotoma, pedunculo crasso dense hispidulo, ramis adscendentibus vel subrectis luteo-hispido, floribus sessilibus vel subessilibus; bracteae linearisubulatae, 1.5-4.5 mm. longae, attenuatae; hypanthium hispidulum; calyx 1 mm. longus, lobis oblongis obtusis hispidulis; fructus subglobosus, glabratus, 3-3.5 mm. longus, fere laevis.—Peru: Tatanara, August, 1854, Lechler 2610 (Herb. Kew., type).

The species is distinguished by the thick and very small leaves with distinctive pubescence.

Palicourea Herrerae, sp. nov.—Frutex vel arbor parva, ramulis gracilibus subteretibus viridibus breviter hispidulis, internodiis brevibus; stipulae in vaginam 2-3 mm. longam puberulam truncatam connatae, vagina in lobos 4 dentiformes c. 1 mm. longos anguste triangulares acutiusculos desinente; folia opposita, petiolo gracili 2-6 mm. longo pilosulo; lamina elliptico-oblonga, 4.5-6 cm. longa, 1-2 cm. lata, longe angustequaque acuminata, acumine obtuso, basi acuta, crasse papyracea, supra viridis, scabra, nervis manifestis sed vix elevatis, subtus pallide viridis, ubique pilis albidis hispidula, costa gracili elevata, nervis lateralibus utroque latere c. 11, gracilibus, prominulis, angulo lato adscendentibus, arcuatim, marginem attingentibus, nervulis manifestis; inflorescentia 3-4 cm. longe pedunculata, dense pauciflora, 1-2 cm. longa et lata, cymoso-paniculata, pedunculo gracillimo, ramulis brevissimis adscendentibus hispidulis; bracteae subulatae 3-7 mm. longae hispidulae; flores conferti sessiles vel subsessiles; hypanthium turbinatum 1.2 mm. longum hispidulum; calyx 2 mm. longus 5-partitus, lobis lanceolato-oblongis acuminatis puberulis; corolla purpurea tubulosa 10 mm. longa, extus hispidula, tubo basi paulo ampliato, fauce 2 mm. lato, lobis 1.5 mm. longis ovali-ovatis obtusis; antherae semiexsertae; stylus corollam aequans, minutissime puberulus; fructus globoso-ovoideus 5 mm. longus sparse pilosus, calyce persistente coronatus.—Peru: Pillahuata, Cerro de Cusilluyoc, Dept. Cuzco, alt. 2,800-3,100 m., May 3-6, 1925, *Francis W. Pennell* 14130 (Herb. Field Mus. No. 558,338, type).

A well-marked species because of the small, abundantly pubescent leaves and small, long-pedunculate inflorescences. It is named for Professor Fortunato L. Herrera, who has collected so diligently in the Department of Cuzco.

Palicourea consobrina, sp. nov.—Frutex, ramulis gracilibus teretibus viridibus glabris, internodiis elongatis; stipulae in vaginam adpressam 2-3 mm. longam glabram connatae, vagina in lobos 4 approximatos lineares 0.8-1.5 mm. longos erectos desinente; folia opposita, petiolo gracili 3-6 mm. longo minute adpresso-pilosulo; lamina elliptico-oblonga vel lanceolato-oblonga, 3.5-6 cm. longa, 1-2 cm lata, longe angustequaque acuminata, acumine obtuso, basi acuta, crasse papyracea, marginata, supra viridis, minute scaberula, nervis manifestis sed vix prominentibus, subtus pallide viridis, praesertim ad nervos minute adpresso-pilosula, ad costam sparse hirtella, costa gracili elevata, nervis lateralibus utroque latere c. 11, gracillimus, prominulis, angulo lato adscendentibus, marginem attingentibus; inflorescentia rubra graciliter pedunculata, dense pauciflora, 1-1.5 cm. longa et lata, pedunculo 2 cm. longo glabro; bracteae oblongae vel lineares, 3-6 mm. longae, acutae vel obtusae, glabrae, infimis interdum foliaceis et viridibus; flores conferti pedicellati, pedicellis

gracilibus plerumque 2-5 mm. longis glabris; hypanthium cylindrico-turbinatum 1 mm. longum glabrum; calyx 5-partitus, laciinis oblongo-linearibus 3.5-4.5 mm. longis, obtusis vel acutiusculis, glabris; corolla (perfecta non visa) purpurea tubulosa 9 mm. longa, extus glabra; antherae lineares 2 mm. longae.—Peru: In forest, Pillahuata, Cerro de Cusilluyoc, Dept. Cuzco, alt. 2,200-2,400 m., May 3-6, 1925, Francis W. Pennell 13988 (Herb. Field Mus. No. 558,230, type).

It is somewhat remarkable that there should occur at this locality the three species here described—*P. consobrina*, *P. Herrerae*, and *P. saligna*—all of which are much alike in general appearance and evidently nearly related. They seem to be quite distinct, however. *P. consobrina* is almost exactly like *P. Herrerae* in aspect, particularly in the form of the leaves and inflorescence, but the two plants differ materially in the nature of the pubescence and in details of the flowers.

Palicourea saligna, sp. nov.—Frutex vel arbor parva omnino glabra, ramulis gracillimis subteretibus, vetustioribus ochraceis, internodiis brevibus vel elongatis; stipulae in vaginam latam 1-1.5 mm. longam viridem truncatam connatae, vagina in dentes 4 remotos triangulares acutos 0.6 mm. longos desinente; folia opposita, petiolo gracili 4-9 mm. longo; lamina lanceolata crasse papyracea, 3-6.3 cm. longa, 0.8-1.8 cm. lata, longe angusteque attenuato-acuminata, acumine obtuso, basi acuta, marginata, supra lutescentiviridis, nervis subimpressis, subtus pallidior, costa gracili elevata, nervis lateralibus utroque latere c. 8, gracilibus, prominentibus, angulo lato adscendentibus, marginem attingentibus; inflorescentia 4-4.5 cm. longe pedunculata, corymbiformi-paniculata, laxe pauci-flora, basi trichotoma, pedunculo gracillimo, ramulis gracilibus curvo-adscendentibus; bractae linearis-subulatae 2-7 mm. longae; flores sparsi pedicellati, pedicellis 1.5-6 mm. longis rectis; hypanthium anguste cylindricum 1 mm. longum; calyx fere 1 mm. longus 5-lobus, lobis inaequalibus rotundato-ovatis apiculatis; fructus immaturus anguste ovoideus 5 mm. longus.—Peru: In forest below Pillahuata, Cerro de Cusilluyoc, Dept. Cuzco, alt. 2,200-2,400 m., May 3-6, 1925, Francis W. Pennell 13978 (U. S. Nat. Herb. No. 1,340,696, type).

The collector's notes describe the corolla as yellow, but no corollas are present on the type specimen.

Psychotria abdita, sp. nov.—Arbor 6-metralis ramosa, ramulis gracilibus subteretibus brunneis glabris, internodiis elongatis; stipulae 2-3 cm. longae, omnino connatae, calyptiformes, 3-4 mm. latae, ferrugineae, glabrae; folia petiolata opposita, petiolo gracili 1-2.5 cm. longo glabro; lamina crasse chartacea, elliptico-oblonga, anguste oblonga vel oblanceolato-oblonga, 13-24 cm. longa, 2.5-9 cm. lata,

longe acuminata, acumine angusto attenuato acuto, basin versus longe sensimque angustata, glabra, supra viridis, nervis non elevatis, subtus paullo pallidior, brunnescens, costa gracili elevata, nervis lateralibus utroque latere 12-16, gracilibus, prominentibus, subarcuatis, angulo lato adscendentibus, prope marginem conjunctis, nervulis obscuris laxissime reticulatis; inflorescentiae terminales vel pseudo-axillares, sessiles, late cymoso-paniculatae, c. 5 cm. longae et 6-8 cm. latae, dense multiflorae, ante anthesin bractea calyptiformi albida (in sicco ferruginea) 2 cm. longa glabra apice in caudam subulatam 13 mm. longam desinente inclusae, basi trichotomae, ramis divaricatis vel angulo lato adscendentibus, validis, minutissime puberulis, floribus ad apices ramulorum dense congestis sessilibus vel 1-2 mm. longe pedicellatis, bracteis minutis deciduis; hypanthium late turbinatum glabrum 1 mm. longum; calyx glaber 0.7 mm. longus truncatus; corolla alba in alabastro 1.5 mm. longa, extus glabra, apice rotundata.—Peru: In sylvis ad pedem montis Campana, prope Tarapoto, December, 1855, R. Spruce 4351 (Herb. Kew., type).

The species is well marked by the peculiar stipules and by the long-beaked bract enveloping the young panicle.

Psychotria Tessmannii, sp. nov.—Rami graciles teretes fusco-brunnei, novellis glabris, internodiis 3.5-11 cm. longis; stipulae persistentes, in vaginam truncatam 2.5-3 mm. longam glabram connatae, vagina in aristas 2 subulatas 6-8 mm. longas glabras desinente; folia opposita, petiolo gracili, 4-10 mm. longo, supra sulcato, glabro vel sparse et minute puberulo; lamina elliptica vel oblongo-elliptica, 7-14.5 cm. longa, 2.5-6 cm. lata, abrupte acuminata vel longiacuminata, acumine falcato angusto acuto, basi acuta vel abrupte contracta et breviter decurrentis, rigide membranacea, utrinque lucidula, supra fusca, glabra, nervis parum prominentibus, subtus vix pallidior, ad nervos sparse et minutissime puberula, costa gracili elevata, nervis lateralibus utroque latere c. 11, angulo acuto adscendentibus, gracilibus, prominentibus, arcuatis, marginem attin-gentibus, nervulis prominulis flexuosis et subparallelis; inflorescentia terminalis, 2-3 cm. longe pedunculata, angustissime paniculata, racemiformis, 6-8 cm. longa, c. 1.5 cm. lata, sublaxa, multiflora, floribus cymosis sessilibus, cymulis pedunculatis densis plurifloris, rhachi sparse et minutissime puberula, ramulis primariis divaricatis, bracteis linearibus vel lanceolatis usque ad 1.5 mm. longis; hypanthium vix 0.5 mm. longum fere glabrum; calyx brevissimus obsolete et obtuse dentatus; corolla infundibuliformis, extus obscure et spar-sissime puberula vel fere glabra, tubo 2.5 mm. longo superne sensim ampliato, lobis 4 oblongis obtusis c. 1 mm. longis; stylus longe exsertus.—Peru: Stromgebiet des Ucayali von 10° S. bis zur Mündung, in 1923, G. Tessmann 3014 (Herb. Stockholm, type). Forest at base of Mt. Campana, December, 1855, Spruce 4383 (Kew).

The species is well characterized by its exceptionally long and narrow inflorescence, recalling that of certain Mexican species of *Rondeletia*.

Psychotria retifera, sp. nov.—Ramuli crassi subteretes dense foliati, novellis pallide tomentellis, vetustioribus cortice ochraceo suberoso obtectis, internodiis 0.5-1 cm. longis; stipulae 2-3 mm. longae, connatae, puberulæ, brevissime bilobæ, lobis rotundatis; folia opposita, petiole crasso 2-4 mm. longo minute puberulo vel glabratu; lamina crasse coriacea, elliptica vel late elliptica, 3-5.5 cm. longa, 1.7-3 cm. lata, acuta, basi rotundata vel obtusa, scaberulo-marginata, ciliata, supra viridis, lucida, costa ciliolata, nervis subimpressis, subtus brunnescens, glabra, costa valida elevata, nervis lateralibus utroque latere c. 20, angulo lato divergentibus, gracilibus, elevatis, infimis fere rectis, superioribus arcuatih, marginem attin- gentibus, nervulis prominulis arcte reticulatis; inflorescentiae ter- minales 2-3 cm. longe pedunculatae, thyrsoido-paniculatae, 1-3 cm. longae, 1-1.5 cm. latae, dense multiflorae, pedunculo valido dense puberulo, ramis primariis brevissimis adscendentibus dense puberulis, floribus sessilibus vel subsessilibus dense confertis; hypanthium tomentellum, calyce subtruncato sparse tomentello; corolla in alabastro 5 mm. longa extus tomentella; fructus subglobosus 8 mm. longus glabratus, subacute costatus.—Peru: Between Huánuco and Pampayacu, January 13, 1927, Ryozo Kanehira 247 (Herb. Field Mus. No. 580,089, type).

In the specimens available the inflorescence is so molded that it is impossible to determine the floral characters satisfactorily. The generic position of the plant is, therefore, somewhat uncertain, and it is possible that the species should be referred rather to *Palicourea*. The plant is clearly distinct from the other *Palicoureas* and *Psychotrias* known from Peru. It is noteworthy because of the small, thick, very broad, beautifully veined leaves.

Psychotria Mathewsi, sp. nov.—Ramuli validi subteretes, glabri vel novelli praesertim prope nodos dense et minute puberuli, inter- nodiis elongatis; stipulae caducae, breviter connatae, ovales vel late ovatae, 1.5-2 cm. longae, prope basin crassae, superne tenuiores, apice rotundatae, brunnescentes, glabrae; folia brevissime petiolata opposita, petiole usque ad 6 mm. longo, saepe fere nullo, minute puberulo vel glabratu, crasso; lamina papyracea, obovato-oblonga vel oblongo-elliptica, 14-27 cm. longa, 6-10.5 cm. lata, acuta vel breviter acuminata, versus basin longe sensimque angustata, basi ipsa interdum obscure auriculata, supra fusca, glabra, nervis non elevatis, subtus pallidior, glabra vel ad nervos minutissime puberula, costa crassiuscula elevata, nervis lateralibus utroque latere c. 15, prominentibus, gracilibus, angulo lato interdum fere recto adscendentibus, leviter arcuatih, juxta marginem conjunctis, nervulis obscuris laxe reticulatis; inflorescentia terminalis plerumque 1.5-2.5 cm. longe pedunculata, late cymoso-paniculata, dense multiflora, ramis verticillatis late adscendentibus gracilibus minute puberulis, floribus ad apices ramulorum dense capitato-congestis sessilibus, bracteis inconspicuis, deciduis vel subpersistib, plerumque late ovatis et

1-2 mm. longis, tenuibus; hypanthium late turbinatum vix 0.5 mm. longum minute puberulum; calyx 0.5 mm. longus, minutissime puberulus, truncatus vel obsolete denticulatus; corolla extus minutissime puberula, tubo late obconico fere 2 mm. longo, ore non barbato, lobis 4 patentibus vel recurvis oblongo-triangularibus obtusis fere 1 mm. longis; antherae exsertae 0.7 mm. longae.—Peru: Moyobamba, in 1835, Mathews 1491 (Herb. Kew., type). Near Tarapoto, November, 1856, Spruce 4203 (K).

This plant is closely related to *P. pallescens* (Rusby) Standl., but differs in its larger stipules and denser, more congested inflorescence.

Psychotria crebrinervia, sp. nov.—Frutex vel arbor 3-4.5 m. alta, ramulis gracilibus, viridibus, subteretibus, puberulis vel minute pilosulis vel glabratris, internodiis brevibus vel elongatis; stipulae persistentes, virides, in vaginam truncatam puberulam 1 mm. longam connatae, in lacinias vel aristas 2 lineares 1.5-3 mm. longas erectas desinentes; folia opposita, petiolo gracili, 1-6 cm. longo, puberulo vel pilosiusculo; lamina membranacea, lanceolato-oblonga vel elliptico-oblonga, 10-21 cm. longa, 3.5-9.5 cm. lata, longe et abrupte sensimve acuminata, basin versus attenuata, supra viridis, glabra, minute puncticulata, nervis non elevatis, subtus paullo pallidior, praesertim ad nervos minutissime puberula vel scaberula, ad nervos interdum breviter pilosiuscula, costa gracili elevata, nervis lateribus utroque latere 15-19, gracillimus, prominentibus, angulo acuto adscendentibus, leviter arcuatis, prope marginem irregulariter conjunctis, nervulis non elevatis laxe reticulatis; inflorescentiae terminales vel pseudo-axillares, cymoso-paniculatae, 5-7 cm. longe pedunculatae, ramosissimae, dense multiflorae, 4-12 cm. longae, 6-12 cm. latae, basi trichotomae, ramulis divaricatis vel interdum subreflexis, gracilibus, breviter pilosulis, bracteis linearibus vel ovatis, viridibus, 2-5 mm. longis, obtusis vel acutiusculis, puberulis vel fere glabris, saepe deciduis, floribus sessilibus et saepe secundis; calyx vix 1 mm. longus, 5-dentatus, dentibus ovato-triangularibus obtusis; fructus globosus, c. 3 mm. longus, glaber, niger, lucidus, pyrenis dorso costulatis.—Honduras: In wet forest, hills near Lancetilla Valley, Dept. Atlántida, alt. 200 meters, January 31, 1928, Paul C. Standley 55286 (Herb. Field Mus. No. 584,201, type.) Lancetilla Valley, Standley 53097, 53222, 56888. Guatemala: Sierra del Mico, alt. 600 m., February, 1908, Kellerman 7536. British Honduras: Big Creek, W. A. Schipp 170.

The plant is a small tree with spreading crown, and with conspicuously brittle branches. It is frequent in the forest about Lancetilla. The species may be recognized by the large, thin, narrow leaves with numerous lateral veins, and by the large, sometimes recurved inflorescence, with very numerous flowers which are inclined to be secund.

Psychotria simiarum, sp. nov.—Frutex vel arbor 1.5-7.5 m. alta, ramulis gracilibus, viridibus, glabris, internodiis brevibus vel elongatis; stipulae virides, persistentes, 1-2 mm. longae, connatae, apice minute bidentatae; folia opposita, petiolo gracili, 8-23 mm. longa, glabro; lamina membranacea, elliptica vel oblongo-elliptica, 8-16 cm. longa, 2.5-7 cm. lata, apice abrupte longiacuminata, acumine angusto attenuato, apice obtuso, basi acuta, glabra, supra viridis, nervis non elevatis, subtus paullo pallidior, costa gracili elevata, nervis lateralibus utroque latere 6-7, angulo acuto adscendentibus, gracilibus, arcuatis, prominentibus, prope marginem conjunctis, nervulis paucis, prominulis, laxe reticulatis; inflorescentiae terminalis, 2-2.7 cm. longe pedunculatae, cymoso-paniculatae, dense multiflorae, c. 2 cm. longae et 2.5 cm. latae, ramulis brevibus oppositis vel infimis radiatis, minutissime puberulis, bracteis lanceolato-subulatis minutis, floribus sessilibus vel brevissime pedicellatis; hypanthium obovooideo-cylindricum, 0.8 mm. longum, fere glabrum; calyx 0.6-0.8 mm. longus, pruinoso-puberulus, breviter dentatus, dentibus conspicue inaequalibus, triangularibus vel late ovatis, obtusis vel acutis, viridibus; corolla ochroleuca, viridescens, in alabastro 2-2.5 mm. longa, extus minute pruinoso-puberula, lobis oblongis obtusis tubum fere aequantibus; fructus subglobosus, caeruleus, glaber, 5-6 mm. longus, pyrenis obscure costatis, facie ventrali anguste sulcatis.—Honduras: In wet forest near the summits of the hills above Lancetilla Valley, Dept. Atlántida, alt. 600 m., March 13, 1928, Paul C. Standley 56772 (Herb. Field Mus. No. 581,799, type). Lancetilla Valley, Standley 52623, 52897, 54639.

A close relative of *Psychotria pubescens* Sw., but in that the leaves are pubescent beneath, rather than glabrous, and have more numerous lateral veins.

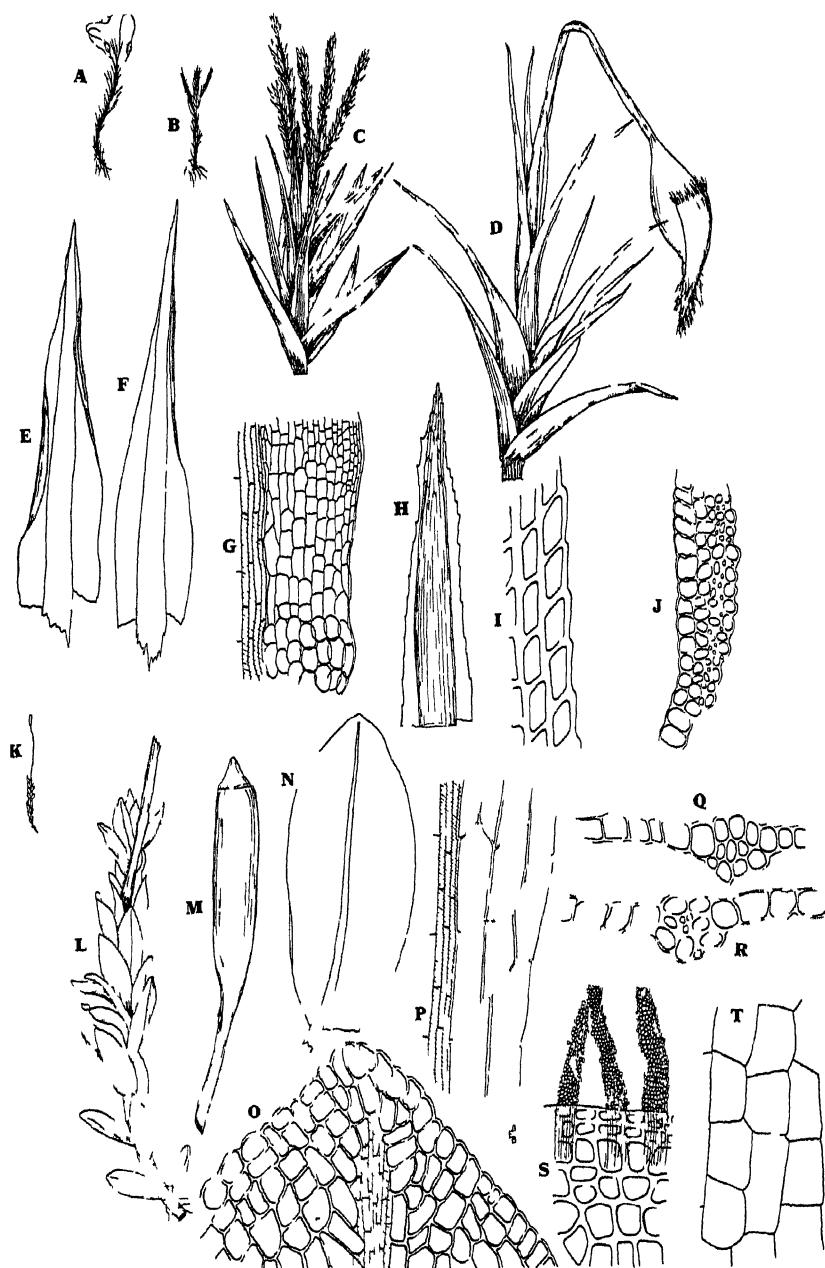
Ixora Gleasonii, sp. nov.—Arbor 6-metralis, ramulis crassiusculis subteretibus brunnescentibus, glabris, internodiis elongatis; stipulae erectae persistentes rotundatae, apice breviter aristato-mucronatae, crassae, glabrae; folia opposita, petiolo crasso glabro 12-16 mm. longo supra sulcato; lamina oblonga vel elliptico-oblonga 14-21 cm. longa, 6-8 cm. lata, apice abrupte breviterque acuminata, acumine acuto, basi acutiuscula vel abrupte contracta et decurrentis, subcoriacea, glabra, costa crassa, nervis lateralibus utroque latere c. 15, angulo lato divergentibus, leviter arcuatis, prope marginem conjunctis; inflorescentia terminalis cymoso-corymbosa, sessilis, trichotoma, 8.5 cm. longa, 16 cm. lata, dense multiflora, ramulis sparse minuteque puberulis, bracteis triangularibus acutis 1.5-3 mm. longis, pedicellis 1-2 mm. longis puberulis; hypanthium puberulum 1 mm. longum; calyx ad medium 4-lobus, lobis late ovatis obtusis ciliolatis et extus puberulis; corolla extus minute puberula, tubo gracillimo 3 cm. longo 0.7 mm. lato, superne non dilatato, lobis 4 patulis vel reflexis ovalibus 4-5 mm. longis apice rotundatis et interdum apiculatis; antherae exsertae oblongae 2 mm. longae; stylus breviter exsertus, stigmatibus 1.2 mm. longis.—British Guiana: Dense upland forest, Butukari,

July 20-21, 1921, H. A. Gleason 710 (U. S. Nat. Herb. No. 1,122,956, type.)

Ixora macrophylla Benth. and *I. laxiflora* Benth., both of which were described from British Guiana, have a much shorter corolla tube than the plant here described.

Morinda mesochora, sp. nov.—Frutex 2-2.5 m. altus, ramulis gracilibus, teretibus, glabris vel sparse et minutissime puberulis, internodiis elongatis; stipulae persistentes, 2-2.5 mm. longae, deltoideae, acutae vel subacuminatae, minute puberulae vel glabrae; folia opposita, petiolo 3-5 mm. longo, gracili, glabro vel minute puberulo; lamina elliptico-oblonga vel rarius obovato-oblonga, saepe in parte media latissima, abrupte acuminata, acumine anguste triangulari, interdum subfalcato, basi acuta vel interdum basin versus angustata, papyracea, glabra, supra viridis, sublucida, costa et nervis prominulis, subtus vix pallidior, costa gracili, elevata, nervis lateribus utroque latere c. 8, gracilibus, prominulis, angulo latiusculo adscendentibus, arcuatis, inaequalibus, prope marginem irregulariter conjunctis, nervulis inconspicuis, laxe reticulatis; inflorescentiae capitatae, in axillis solitariae, 1-2.2 cm. longe pedunculatae, pedunculis gracillimis, glabris vel minute puberulis, capitulis paucifloris, floribus sessilibus, congestis; hypanthium cylindricum, 2 mm. longum, calyx cupularis, 1 mm. longus, truncatus; corolla extus glabra, tubo gracili, 6 mm. longo, lobis linear-lanceolatis, 6 mm. longis; fructus 5-6 mm. longus.—British Honduras: Honey Camp, Orange Walk, September, 1928, C. L. Lundell 19 (Herb Field Mus. No. 580,825, type). Guatemala: Brushy slope, Quiriguá, Dept. Izabal, May, 1922, Standley 24529.

The proposed species is most nearly related to *M. panamensis* Seem., which also occurs in Guatemala. The latter differs in its broader leaves, stout peduncles, and obtuse stipules. From *M. Roioc* L. the present plant is distinguished by its broader leaves and long peduncles.



CAMPYLOPUS HONDURENSIS AND SPLACHNOBRYUM BERNOULLII.

FIELD MUSEUM OF NATURAL HISTORY
FOUNDED BY MARSHALL FIELD, 1893

PUBLICATION 267

BOTANICAL SERIES

VOL. IV, No. 9

HONDURAN MOSSES
COLLECTED BY PAUL C. STANLEY

BY
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CHICAGO, U. S. A.

December 10, 1929

PRINTED IN THE UNITED STATES OF AMERICA
BY FIELD MUSEUM PRESS

HONDURAN MOSSES

COLLECTED BY PAUL C. STANDLEY

EDWIN B. BARTRAM

Very little is known with regard to the mosses of Honduras outside of a few scattered records, evidently representing random or casual gatherings. The collection made by Mr. Standley during the winter of 1927-28 is therefore of unusual interest as it gives us the first general idea of the mosses of this Central American Republic and their relationships with the surrounding regions that are better known bryologically. The data are still too meagre to afford any satisfactory outline of geographical distribution but, in a general way, the bonds are very evidently and naturally with Mexico and the Antilles rather than with the cordilleran types of Costa Rica and Panama to the south and west.

The occurrence in Honduras of *Crossomitrium Herminieri* and *Leucoloma tortellum*, previously known only from Guadeloupe and Trinidad, and of the Brazilian species, *Meesea Ulei* and *Macromitrium Podocarpi*, together with many of the more familiar West Indian types, is strongly suggestive of a land bridge across the Caribbean banks to Jamaica and through the arc of the Antilles to South America, but the true significance of these facts may well wait for more detailed substantiation.

The 178 numbers comprised in this collection represent seventy-nine species, including four new species, *Campylopus hondurensis*, *Bryum Standleyi*, *Bryum bursiforme*, and *Rhynchostegium patulum*, which are described and figured below. The types of these new species and a complete series of specimens are in the herbarium of Field Museum of Natural History and in the herbarium of the writer.

About three-fourths of the specimens are from the Department of Atlántida,¹ on the north coast, and the remainder from the Department of Comayagua in the interior. The localities with

¹Science 78: 265. 1928.

their corresponding sequence of numbers and field data are as follows:

52636-54198.—Lancetilla Valley, near Tela, Department of Atlántida, altitude 20-600 meters, December 6, 1927-March 20, 1928.

54261-54285.—Vicinity of Tela, Department of Atlántida, at sea level, December 14, 1927-March 15, 1928.

54326-55657.—Lancetilla Valley, near Tela, Department of Atlántida, altitude 20-600 meters, December 6, 1927-March 20, 1928.

55727-55784.—La Fragua, Department of Atlántida, altitude 20 meters, February 7, 1928.

55796-55803.—Lancetilla Valley, near Tela, Department of Atlántida, altitude 20-600 meters, December 6, 1927-March 20, 1928.

55844-56053.—Vicinity of Siguatepeque, Department of Comayagua, altitude 1,080-1,400 meters, February 14-27, 1928.

56101-56162.—In pine forest, El Achote, near Siguatepeque, Department of Comayagua, altitude 1,500 meters, February 18, 1928.

56201-56536.—Vicinity of Siguatepeque, Department of Comayagua, altitude 1,080-1,400 meters, February 14-27, 1928.

56704.—Lancetilla Valley, near Tela, Department of Atlántida, altitude 20-600 meters, December 6, 1922-March 20, 1928.

FISSIDENTACEAE

Fissidens Kegelianus C. M.

Nos. 55299, 55547, 55576.

This species occurs rather frequently in Mexico, reaches the southern border of the United States in Louisiana near New Orleans, and ranges through the West Indies to northern South America, but this appears to be the first collection from any of the Central American countries. The lax areolation of the duplicate blades, especially toward the costa, readily distinguishes this species from its congeners in the section *Bryoidium*.

Fissidens circinans Schpr.

No. 56201.

Fissidens asplenoides (Sw.) Hedw.

No. 56383.

DICRANACEAE

Trematodon reflexus C. M.

Nos. 53185, 54036.

Dicranella Herminieri Besch.

No. 54027.

Campylopus subleucogaster (C. M.) Jaeg. & Sauerb.

Nos. 56108, 56117.

Campylopus hondurensis Bartr., sp. nov. PLATE XVII, FIGS. A-J.

Dioicous. Plants densely cespitose, yellowish green at the tips, light brown below. Stems erect, 10-15 mm. high, radiculose throughout, simple or sparingly branched, when sterile usually with apical clusters of short, brittle, microphyllous branches that evidently serve as a means of vegetative reproduction; leaves erect and flexuose when dry, spreading and somewhat secund when moist, oblong-lanceolate, carinate, about .3 mm. long, tapering gradually to a relatively short, grooved point; margin plane, minutely denticulate for a short distance below the apex, entire below; costa about 180 μ wide at the base, tapering upward and percurrent or ending just below the blunt apex, slightly ridged on the dorsal side and denticulate on the back near the apex, in cross-section near the middle showing a row of large cells on the ventral surface, a median row of somewhat smaller, irregular cells and a dorsal band of stereid cells with the outer layer differentiated; alar cells conspicuous, brownish or hyaline, extending to the costa, the cells just above short-rectangular, in vertical rows with thin, straight walls, averaging about 30 μ long by 25 μ wide toward the costa, gradually smaller toward the margins and upward, upper cells small, rhomboidal, chlorophyllose; seta 7-8 mm. long, reddish, strongly cygneous both moist and dry so that the capsules are usually imbedded in the axils of the upper leaves; capsule ovoid, symmetrical, furrowed when dry, 1.5 mm. long without the lid; exothecal cells linear, incrassate, strongly nodulose; annulus about 35 μ high; peristome teeth deep red and vertically striate about halfway up, pale and papillose above, divided to about the middle into two slender forks; operculum conic-rostrate, 1 mm. long; calyptora extending a little below the middle of the urn, cucullate, deeply fringed at base, radiculose at apex when imbedded in tomentum of upper stem; spores smooth, 10 μ in diameter.

TYPE: In pine forest, El Achote near Siguatepeque, Department of Comayagua, Honduras, altitude 1,500 meters, February 18, 1928, Paul C. Standley 56157a. Also from same locality, on log, No. 56149a.

The symmetrical capsules and lax basal leaf cells suggest a comparison with *C. subleucogaster* but the Honduran plant is clearly distinguished by the smaller leaves with shorter points, narrower costa ending in or below the apex, conspicuous alar cells, long ciliate calyptra, and the apical clusters of microphyllous branches.

Campylopus introflexus (Hedw.) Brid.

Nos. 55884, 56280.

Atractylocarpus costaricensis (C. M.) R. S. Williams.

No. 56399.

Holomitrium arboreum Mitt.

No. 54188.

Leucoloma serrulatum Brid.

No. 53184.

Leucoloma tortellum (Mitt.) Jaeg.

No. 53218.

The widely spreading leaves with crisplate points when dry are not at all suggestive of the more familiar species of this genus. Unfortunately Mr. Standley's collection is sterile, as are those from Trinidad and Guadeloupe, so that the sporophyte characters are still unknown, but it is interesting to record this rare species from the continental mainland for the first time.

LEUCOBRYACEAE

Leucobryum antillarum Schpr.

No. 56394.

Leucobryum Polakowskyi (C. M.) Card.

No. 56149.

Octoblepharum albidum (L.) Hedw.

Nos. 53481, 54094, 54285, 54387, 55248, 55345.

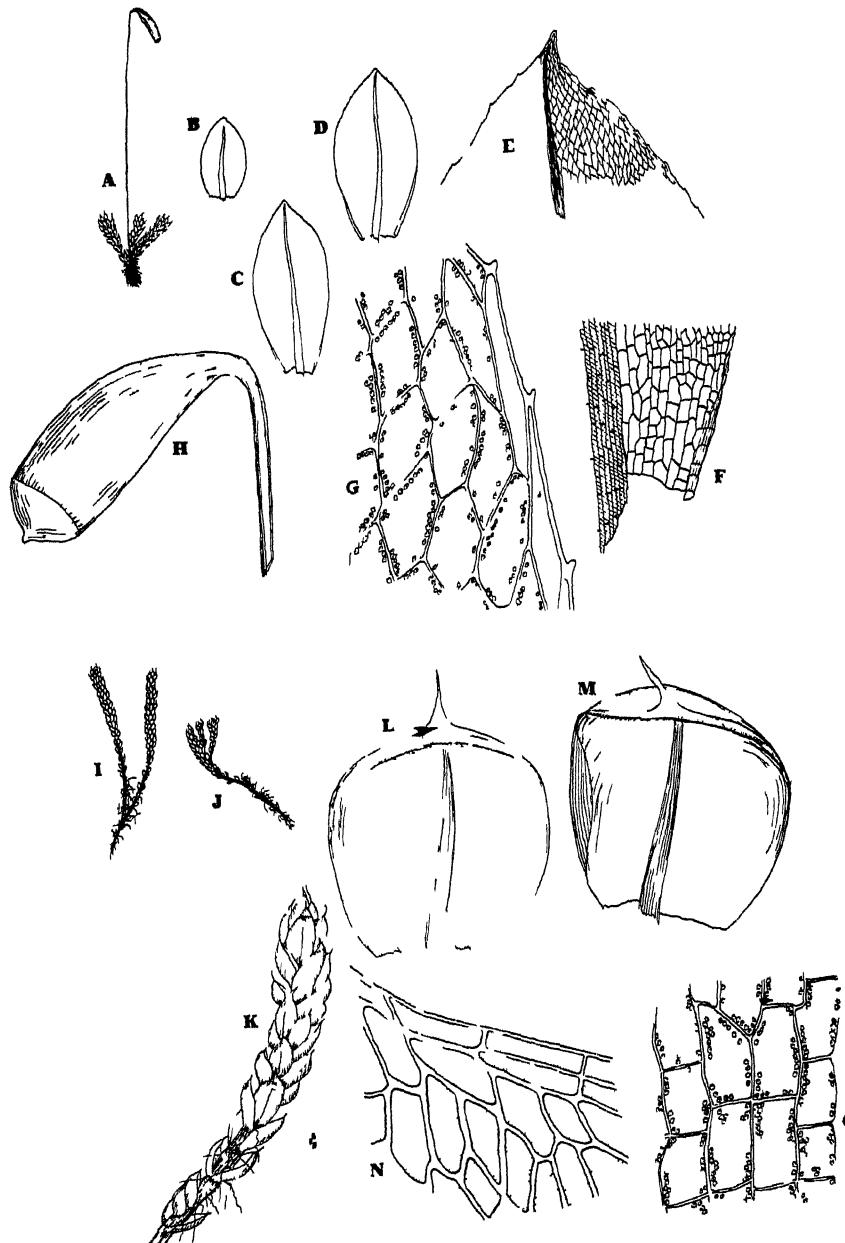
Octoblepharum pulvinatum (Doz. & Molkb.) Mitt.

Nos. 52734, 54179.

CALYMPERACEAE

Syrrhopodon incompletus Schwaegr.

Nos. 52763, 53987, 54284, 55441.



BRYUM STANLEYI AND BRYUM BURSIFORME

Calymperes emersum C. M.

No. 54376.

The type collection from Guatemala and one from southern Florida seem to be the only previous records for this little known species.

POTTIACEAE**Trichostomum jamaicense** (Mitt.) Jaeg.

No. 56416.

Leptodontium sulphureum (C. M.) Mitt. var. **Motelayi** (R. & C.) Bartr.

No. 56102.

Hyophila Tortula (Schwaegr.) Hamp.

No. 54895.

FUNARIACEAE**Funaria epipedostegia** Card.

No. 56420.

Funaria calvescens Schwaegr.

Nos. 53159, 55523, 56155, 56536.

SPLACHNACEAE**Splachnobryum Bernoullii** C. M. Plate XVII, Figs. K-T.

No. 53516.

BRYACEAE**Bryum bursiforme** Bartr., sp. nov. PLATE XVIII, FIGS. I-O.

Evidently dioicous. Densely tufted, about 2 cm. high, pale whitish green, not glossy, when dry. Stems reddish, variously branched, branches claviform, loosely foliate below, julaceous above the middle especially when moist; leaves orbicular or broader than long, 0.5-0.6 mm. long, rather flattened and fan-shaped when dry, densely imbricated, abruptly short-apiculate, very concave or cochleariform when moist with a sac or pocket of colorless cells just below the acumen, lightly sulcate in the median portion; margin entire, plane below, broadly reflexed toward the base of the apiculus; costa relatively broad but thin, rather lutescent, ending below the apex in the area of hyaline cells; lower and median leaf cells chlorophyllose, thin-walled, rectangular toward the base, becoming rhomboidal-hexagonal above, upper cells hyaline and colorless, averaging somewhat broader than the median and with thicker walls, more elongate at margin but not forming a distinct border. Sporophyte unknown.

TYPE: Wet, sandy soil, Lancetilla Valley, near Tela, Department of Atlántida, Honduras, altitude 20-600 meters, January 4, 1928, *Paul C. Standley 54032.*

The very concave, suborbicular leaves with a distinct pocket formed by the strongly cucullate apex distinguish this species at once from any of its allies in the section *Argyrobryum.*

Bryum coronatum Schwaegr.

Nos. 53240, 54106, 55634.

Bryum microbalanum Card.

No. 54326.

Bryum Crugeri Hamp.

No. 54033.

Bryum Standleyi Bartr., sp. nov. PLATE XVIII, FIGS. A-H.

Dioicous? Male flowers not seen. Plants short, densely tufted, pale green, not glossy, matted together with radicles in the lower parts. Leaves broadly ovate, somewhat shrunken and loosely flexuose-spreading when dry, erect-spreading when moist, the lower small and obtuse, the upper 2 mm. long, acute, slightly concave; margin narrowly recurved below, flat and denticulate in upper half; costa stout, tapering upward, percurrent in upper leaves, ending below apex in lower leaves; lower leaf cells oblong, narrower and elongated toward margin, upper cells rhomboid-hexagonal, thin-walled, 1 or 2 rows at margin narrower but hardly forming a distinct border; seta about 2.5 cm. long, reddish; capsule (immature) subcylindrical with a short neck, pendulous, about 2.5 mm. long; lid conic-apiculate.

TYPE: On log, vicinity of Tela, Department of Atlántida, at sea level, January 9, 1928, *Paul C. Standley 54261.* Also on logs, Lancetilla Valley, near Tela, altitude 20-600 meters: Nos. 54327, 54373, 54379, 54437, 55350, 55641. On rock, Lancetilla Valley, near Tela, No. 54413.

This species may be provisionally referred to the *Apalodictyon* group, including *B. Crugeri* and its allies, but it is readily distinguished from any of these species by the broadly ovate, short-pointed leaves which are more or less shriveled and loosely flexuose-spreading when dry. It is apparently common on old logs in the Lancetilla Valley near Tela, judging from the various collections enumerated above, and seems to be constant in general appearance and in microscopic characters. None of the capsules are ripe enough

to show the peristome characters in detail, but fragments of appendiculate cilia were clearly observed.

Bryum andicola Hook.

No. 55648.

Rhodobryum Beyrichianum (Hook.) Par.

No. 56491.

RHIZOGONIACEAE

Rhizogonium spiniforme (L.) Bruch.

Nos. 52902, 53953.

MEESEACEAE

Meesea Ulei C. M. PLATE XIX, FIGS. A-K.

No. 56114a.

I was at first tempted to believe that this collection from El Achote, which is in good fruit, represented an undescribed species, very close to *M. longiseta* of the north but differing in the recurved basal leaf margins, shorter setae, and smaller capsules. Subsequently a comparison with the description of *M. Ulei*, of Brazil, indicated that these characters are exactly those by which this species was differentiated.

Since no type material of *M. Ulei* is available and the evidence, as far as it goes, is entirely favorable, I have referred Mr. Standley's collection to the Brazilian species.

It would be hard to imagine a more unexpected genus in a tropical country, although I understand from Mr. Standley that several ferns and flowering plants typical of the flora of the northeastern United States have been found in the pine-forested region near Siguatepeque.

BARTRAMIACEAE

Philonotis tenella (C. M.) Besch.

Nos. 53477, 54030, 54031, 56704.

Philonotis sphaericarpa (Sw.) Brid.

Nos. 54455, 56136.

ORTHOTRICHACEAE

Macromitrium Podocarpi C. M.

No. 56202.

The combination of short branches, narrowly linear, acute leaves with incurved crispatate points when dry, round-hexagonal, mamilllose upper leaf cells with thin walls, and elongated basal cells with knoblike papillae distinguishes these plants at once from any species credited to North America. Unfortunately the collection is sterile, but the vegetative characters agree so closely with those of the Brazilian moss that I am satisfied it is either this or a very nearly related species. Strangely enough this is the only *Macromitrium* represented in the collection.

***Micromitrium Schlumbergeri* Schp.**

No. 56517a.

***Schlotheimia Sartorii* C. M.**

Nos. 54359, 55204, 56507.

HELICOPHYLLACEAE

***Helicophyllum torquatum* (Hook.) Brid.**

No. 54392.

RHACOPILACEAE

***Rhacopilum tomentosum* (Sw.) Brid.**

Nos. 52938, 55618.

CRYPHAEACEAE

***Acrocryphaea mexicana* Schp.**

No. 55981.

PTEROBRYACEAE

***Orthostichopsis tetragona* (Sw.) Broth.**

Nos. 53382, 54565, 54569, 55657, 55734.

METEORIACEAE

***Pilotrichella rigida* (C. M.) Besch.**

Nos. 53201, 53966.

***Papillaria appressa* (Hsch.) Jaeg.**

Nos. 54603, 55752, 56488.

***Papillaria nigrescens* (Sw.) Jaeg.**

Nos. 52963, 54381, 54607, 54850, 55339, 55727.

***Meteoriump illecebrense* (C. M.) Mitt.**

No. 56203.

Meteoriopsis patula (Sw.) Broth.

Nos. 52770, 53207, 53384, 53492, 54616, 55510, 56476.

NECKERACEAE**Neckeropsis undulata** (Palis.) Broth.

No. 55778.

Homalia glabella (Sw.) Mitt.

No. 52903.

Porotrichum plicatulum Mitt.

No. 55617.

It is interesting to note the occurrence of this species in Central America again, it having been collected by Mr. Standley in Costa Rica in 1924.¹ Both collections are from near sea level, and it is evidently a moss of the "tierra caliente."

HOOKERIACEAE**Cyclodictyon albicans** (Sw.) Broth.

No. 54896a.

Callicostella cruceana (Dub.) Jaeg.

Nos. 54570, 55279, 55392, 55549.

This and the two following species have been distinguished as follows:

Dioicous.

Seta papillose *C. ciliata*.

Autoicous.

Seta smooth *C. cruceana*.

Seta papillose *C. pallida*.

Numerous species of this difficult genus have been credited to tropical North America, but the distinguishing characters are so intangible that any satisfactory understanding of the species represented in these regions seems to be contingent upon a careful revision of the whole group.

Callicostella ciliata (Schp.) Jaeg.

Nos. 54562, 54844.

Callicostella pallida (Hsch.) Jaeg.

Nos. 53296, 54407, 54566, 55750.

Lepidopilum polytrichoides (Hedw.) Brid.

No. 53220.

¹Contr. U. S. Nat. Herb. 26: 97. 1928.

Crossomitrium Herminieri (Schp.) Jaeg.

No. 54901.

This is another rare and attractive species previously known only from Guadeloupe and therefore a noteworthy addition to the moss flora of Central America. The pale yellow, glossy stems are closely applied to twigs and leaf surfaces of living trees. The lateral leaves are widely spreading and regularly arched with deflexed points, giving the stem a singularly attractive and characteristic appearance.

Rhynchostegiopsis flexuosa (Sull.) C. M.

Nos. 52898, 54633, 54644.

FABRONIACEAE**Fabronia flavinervis** C. M.

No. 56489.

THUIDIACEAE**Rauia subcatenulata** (Schp.) Broth.

No. 55939.

Thuidium involvens (Hedw.) Mitt.

Nos. 54121, 54794.

Thuidium miradoricum Jaeg.

Nos. 53216, 54198, 54580.

Thuidium delicatulum (Dill., L.) Mitt.

Nos. 56105, 56328.

BRACHYTHECIACEAE**Brachythecium stereopoma** (Spruce) Jaeg.

While this solitary collection of *Brachythecium* is sterile, I have been unable to distinguish it from *B. stereopoma*, of the West Indies and South America.

Rhynchostegium patulum Bartr., sp. nov. PLATE XIX, FIGS. L-T.

Autoicous. Male buds about 0.05 mm. long, of 5 or 6 ecostate, concave bracts, denticulate above the middle, enclosing 2-4 antheridia mixed with a few filiform paraphyses of about equal length. Stems prostrate, sparingly radiculose, irregularly branched, forming thin, glossy, pale green mats, slender and patulous, flattened, often flageliform. Leaves complanate, slightly flexuose-spreading with decurved

tips when dry, more stiffly divergent when moist, oblong-ovate, bluntly acute, asymmetrical, slightly concave toward the base, flat above, up to 1.25 mm. long but usually smaller, margin plane, minutely denticulate nearly to the base; costa from one-half to two-thirds the leaf length, ending in a minute prickle on the back; upper leaf cells linear, vermicular, 10 to 12 times as long as wide, lightly papillose by projecting ends on the back, basal cells shorter and broader, rectangular with rounded corners toward the costa, narrower and more elongated toward the margins; perichaetal leaves clasping, the outer small, blunt, ecostate, the inner longer, costate, rather abruptly narrowed to an erect, denticulate, acuminate point; seta reddish, smooth, about 1 cm. long; capsule horizontal, short-ovoid, about 1 mm. long, constricted under mouth and gibbous at back when dry; annulus present; peristome normal; lid rostrate from a conical base.

TYPE: On wet rock, Lancetilla Valley, near Tela, Department of Atlántida, Honduras, altitude 20-600 meters, January 31, 1928, *Paul C. Standley 55305.*

The following numbers are from the same locality: 54414, 54896, 55258.

Near *R. leptomerocarpon*, of Mexico, but smaller throughout, with shorter, narrower, more bluntly pointed leaves, more elongate areolation, a larger area of short, juxta-costal basal cells, and a smaller capsule.

ENTODONTACEAE

Erythrodontium longisetum (Hook.) Par.

Nos. 56498, 56517.

PLAGIOTHECIACEAE

Stereophyllum turgidulum Card.

No. 55938.

SEMATOPHYLLACEAE

Rhaphidorrhynchium obliquerostratum (Mitt.) Broth.

No. 56147.

Sematophyllum loxense (Hook.) Mitt.

Nos. 52771, 52934, 53223, 53482, 54851, 55588.

Sematophyllum galipense (C. M.) Mitt.

Nos. 55947, 56404, 56213, 56226, 56482.

Sematophyllum Kegelianum (C. M.) Mitt.

Nos. 53816, 54092, 54363.

Sematophyllum chrysocladum Card.

No. 56156.

Taxithelium planum (Brid.) Mitt.

Nos. 53121, 53227, 53239, 53527, 53905, 54377, 54426, 55320,
55784.

Trichosteleum microcarpum (Sw.) Broth.

Nos. 53663, 55632, 55635, 55638.

HYPNACEAE

Isopterygium miradoricum (C. M.) Par.

No. 56053.

Isopterygium diminutivum Bartr

Nos. 55796, 55803.

When the description of this species was published¹ the specific name was, through a typographical oversight, misspelled. The correct name is as given above.

Vesicularia amphibola (Spruce) Broth.

Nos. 52636, 53210, 54431, 55907.

Microthamnium thelistegum (C. M.) Mitt.

Nos. 55945, 56422.

Microthamnium scalpellifolium C. M.

No. 54862.

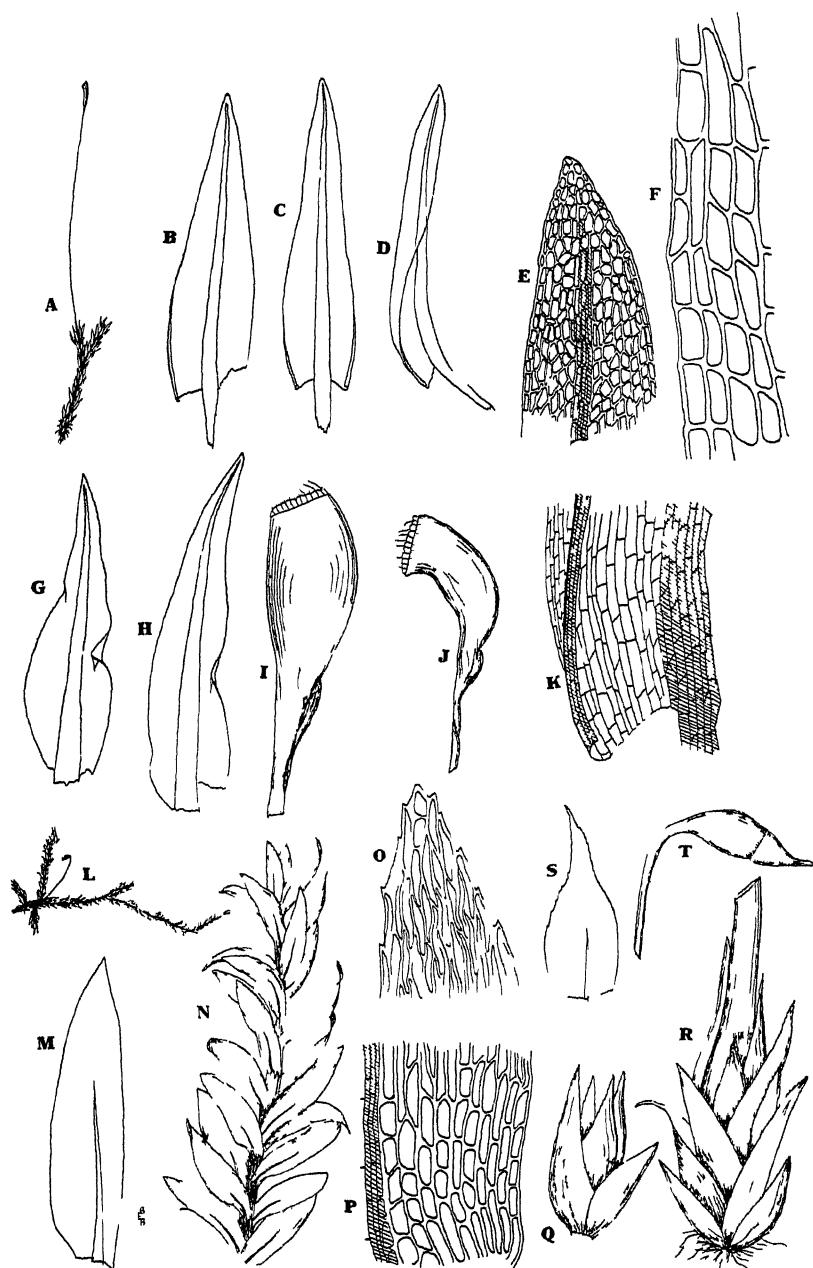
Through the kindness of Dr. Reimers, of the Berlin Botanical Museum, it has been possible to compare this collection with the type material from Mazatenango, Guatemala, collected by Bernoulli and Cario, No. 82. They are absolutely identical.

The minute, squarrose-spreading, triangular-ovate stem leaves are clearly differentiated from the much larger, oblong-ligulate, abruptly acute, and very complanate branch leaves, so I am strongly tempted to think that Dr. Muller's intuition was not at fault when he originally placed this plant in *Microthamnium*.

The "folia caulina disticha densiusculae equitantiae parva ***" of the original description² is inaccurate and misleading, and evidently refers to the branch leaves. Without the original specimen as a

¹Journ. Wash. Acad. Sci. 18: 581. 1928.

²Bull. Herb. Boiss. 5: 214. 1897.



MEESEA ULEI AND RHYNCHOSTEGIUM PATULUM

check, Dr. Brotherus may have been misled by this reference in transferring the species to *Isopterygium*¹ and later to *Taxiphyllum*.² The strongly complanate branches are very suggestive of some of the species now included in this latter genus but the fine, wiry, arched primary stems and dimorphous leaves seem to throw the balance clearly to the side of *Microthamnium*.

The rediscovery of this species is noteworthy and it is a satisfaction to be able to establish its identity.

POLYTRICHACEAE

Catharinaea angustata Brid. var. *rhytidophylla* (C. M.) Dixon.

Nos. 56150, 56162.

In an attempt to reconcile these specimens with the Mexican *C. Schimperi*, from which they are indistinguishable, I can not avoid the conclusion that all these plants merely represent the variety *rhytidophylla* (C. M.) Dixon of our familiar species. There are certainly no structural differences between these tropical plants of high altitudes and *C. angustata* Brid., and every variation in size, number and height of the lamellae, shape and length of the capsule, etc., can be found in collections from temperate regions. The leaves of the Mexican and Honduran plants are more crisped when dry, the lamina is more strongly undulate and more sharply spinose on the margins and back, all of which are marks of the variety *rhytidophylla*, as evidenced by authentic specimens received from Mr. H. N. Dixon. Identical plants combining these characters have been collected recently in the mountains of Jamaica by Mr. C. R. Orcutt, and I fail to see what practical purpose is served by maintaining the southern form as a distinct species.

The synonymy of this variety in tropical North America, as I understand it, is as follows:

Atrichum Mulleri Schp. in herb. in Besch. Mem. Soc. Sci. Nat. Cherbourg 16: 206. 1872.

Atrichum Schimperi Jaeg. Ber. St. Gall. Nat. Ges. 1877-78: 439. 1879.

Atrichum conterminum Card. Rev. Bryol. 37: 5. 1910.

Atrichum Mulleri var. *conterminum* Ther. Smiths. Misc. Coll. 78²: 20. 1926.

¹Engl. & Prantl, Planzenfam. 1³: 1080. 1909.

²Engl. & Prantl, Planzenfam. Ed. 2. 11: 462. 1925.

Catharinaea Schimperi Broth. in Engl. & Prantl, Planzenfam.
1³: 673. 1909.

Catharinaea contermina Broth. in Engl. & Prantl, Planzenfam.
Ed. 2. 11: 495. 1925.

If the facts have been interpreted correctly it would seem that this variety should be designated as *Catharinaea angustata* Brid. var. **Mulleri** (Schp.) comb. nov.

EXPLANATION OF PLATES

PLATE XVII

CAMPYLOPUS HONDURENSIS Bartr.

- Fig. A. Fruiting plant $\times 1\frac{1}{2}$.
B. Plant with microphyllous branches $\times 1\frac{1}{2}$.
C. End of stem with microphyllous branches $\times 14$.
D. Tip of stem and sporophyte $\times 9$.
E, F. Stem leaves $\times 19$.
G. One side of leaf base $\times 90$.
H. Apex of leaf $\times 90$.
I. Upper leaf cells and margin $\times 570$.
J. Part of cross-section of costa $\times 285$.

SPLACHNOBRYUM BERNOULLII C. M.

- K. Fruiting plant $\times 1\frac{1}{2}$.
L. Fruiting plant $\times 9$.
M. Operculate capsule $\times 19$.
N. Stem leaf $\times 45$.
O. Apex of leaf $\times 300$.
P. Juxta-costal leaf cells near base $\times 300$.
Q. Part of cross-section from upper half of leaf $\times 300$.
R. Part of cross-section from lower part of leaf $\times 300$.
S. Part of peristome and rim $\times 300$.
T. Median exothecal cells $\times 300$.

PLATE XVIII

BRYUM STANDLEYI Bartr.

- Fig. A. Moist plant $\times 1\frac{1}{2}$.
B. Lower stem leaf $\times 11$.
C, D. Upper stem leaves $\times 11$.
E. Apex of stem leaf $\times 50$.
F. One side of leaf base $\times 50$.
G. Upper leaf cells and margin $\times 300$.
H. Moist capsule $\times 11$.

BRYUM BURSIFORME Bartr

- I, J. Plants $\times 1\frac{1}{2}$.
K. End of stem $\times 11$.
L. Stem leaf, dorsal view $\times 50$.
M. Stem leaf, ventral view $\times 50$.
N. Hyaline cells at base of acumen and margin $\times 300$.
O. Group of basal cells midway between costa and margin $\times 300$.

PLATE XIX

MEESEA ULEI C. M.

- Fig. A. Plant $\times \frac{2}{3}$.
B, C, D. Stem leaves $\times 18$.
E. Apex of stem leaf $\times 90$.
F. Upper leaf cells and margin $\times 285$.
G, H. Perichaetial leaves $\times 10$.
I. Moist capsule $\times 9$.
J. Dry capsule $\times 9$.
K. One side of leaf base $\times 90$.

RHYNCHOSTEGIUM PATULUM Bartr.

- L. Plant $\times 1\frac{1}{2}$.
- M. Branch leaf $\times 50$.
- N. Tip of branch $\times 19$.
- O. Apex of leaf $\times 285$.
- P. One side of leaf base $\times 285$.
- Q. Antheridial bud $\times 50$.
- R. Perichaetium $\times 50$.
- S. Inner perichaetal leaf $\times 50$.
- T. Moist operculate capsule $\times 9$.

